CHAPTER 8
FINAL DRIVE

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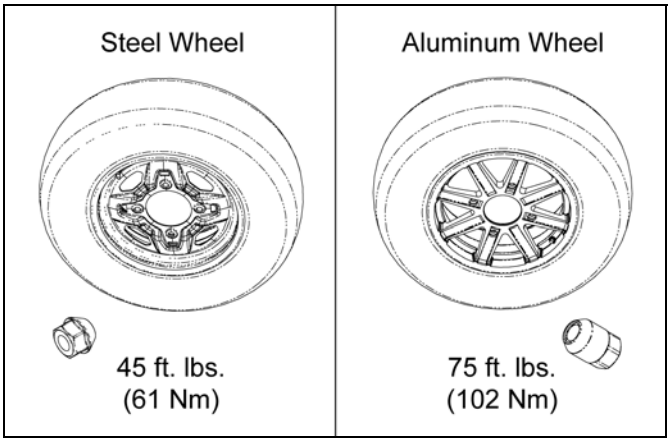
GENERAL SPECIFICATIONS

Torque Specifications

Item	Nut Type	Specification
Aluminum Wheels	Tapered Nut (Long)	75 ft. lbs. (102 Nm)
Steel Wheels	Tapered Nut (Short)	45 ft. lbs. (61 Nm)



Item	Specification
Wheel Hub Retaining Nuts	80 ft. lbs. (108 Nm)
Steering Post to Bulkhead	20 ft. lbs. (27 Nm)
Steering Post to Gearcase	22 ft. lbs. (30 Nm)
Tie Rod to Bearing Carrier Tie Rod to Steering Frog	44 ft. lbs. (60 Nm)
Brake Caliper Mount Bolts	37 ft. lbs. (50 Nm)
Shock Mounting Bolts	37 ft. lbs. (50 Nm)
Front Ball Joint Pinch Bolts (upper and lower) Replace fasteners if loosened	17 ft. lbs. (23 Nm) + 1/4 Turn or (90°)
Front A-arm to Frame Bolts (upper and lower)	40 ft. lbs. (54 Nm)
Front Gearcase Mount Bolts	36 ft. lbs. (49 Nm)
Rear A-arm to Frame Bolts (upper and lower)	45 ft. lbs. (61 Nm)
Rear Upper A-Arm to Bearing Carrier Bolts	40 ft. lbs. (54 Nm)
Rear Lower A-Arm to Bearing Carrier Bolts	45 ft. lbs. (61 Nm)
Rear Propshaft Bolts	18 ft. lbs. (24 Nm)
Rear Gearcase Mount Bolts	40 ft. lbs. (54 Nm)

CAUTION

Locking nuts, and bolts with pre-applied locking agent should be replaced if removed.
The self-locking properties of the nut or bolt are reduced or destroyed during removal

Special Tools

Part Number	Tool Description
2872608	Roller Pin Removal Tool
PU-48951	Axle Boot Clamp Tool
8700226	CV Boot Clamp Pliers (Ear)

WHEELS

Removal

1. Position the vehicle on a level surface.
2. Stop the engine, place the transmission in PARK and lock the parking brake.
3. Loosen the wheel nuts slightly.
4. Elevate the appropriate side of the vehicle by placing a suitable stand under the footrest frame.
5. Remove the wheel nuts and remove the wheel.

Installation

1. Verify the transmission is still in PARK and the parking brake is locked.
2. Place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward forward rotation.
3. Install the wheel nuts and finger tighten them to align the center of the wheel holes with the center of the tapered nuts.

IMPORTANT: It is possible to torque the wheel nut on a steel rim without the nut being centered in the hole. Be sure to center the wheel nuts before applying torque to prevent wheel nuts from coming loose.

4. Carefully lower the vehicle to the ground.
5. Torque the wheel nuts to the proper torque specification.

CAUTION

Improperly installed wheels could affect vehicle handling and tire wear. On vehicles with tapered rear wheel nuts, make sure tapered end of nut goes into taper on wheel. Be sure to properly torque and install all wheel nuts.

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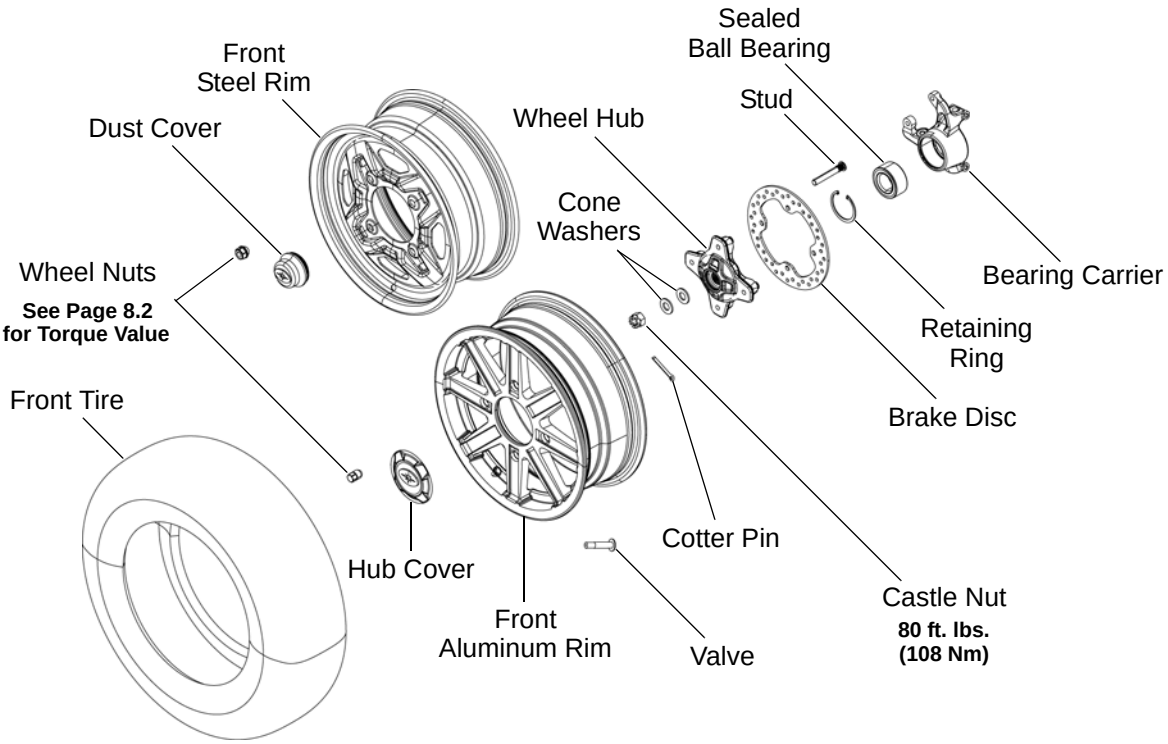
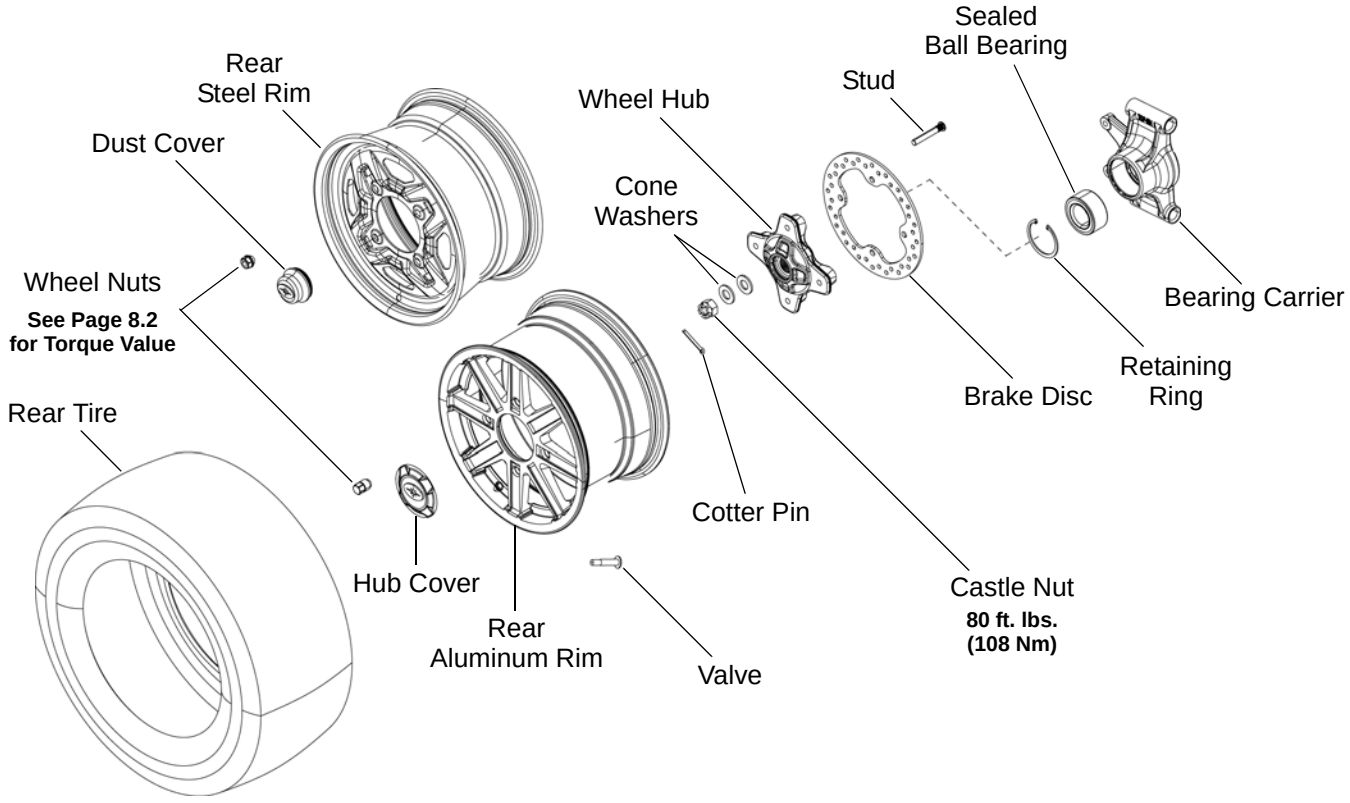
WHEEL HUBS

Front Hub Exploded View



Rear Hub Exploded View



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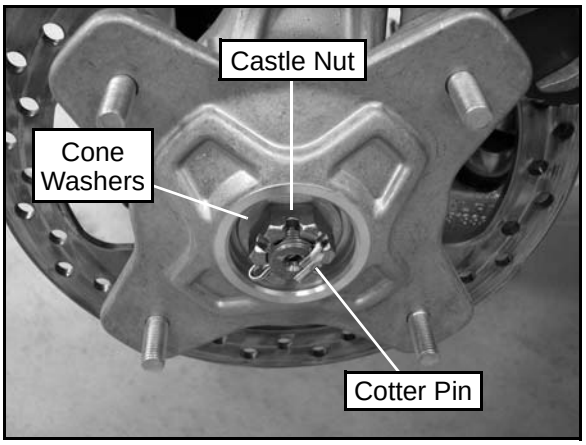
FRONT BEARING CARRIER

Inspection / Removal

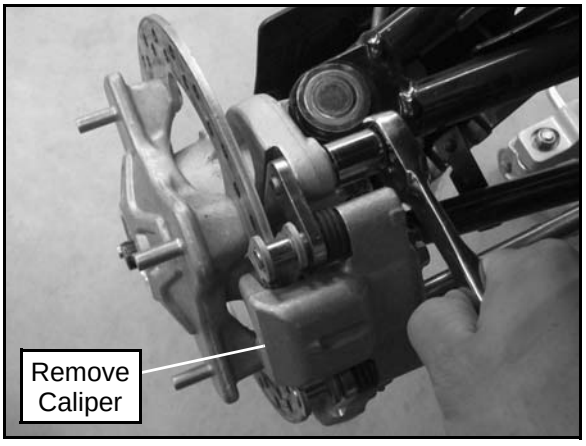
1. Elevate front of vehicle and safely support machine under the frame area.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

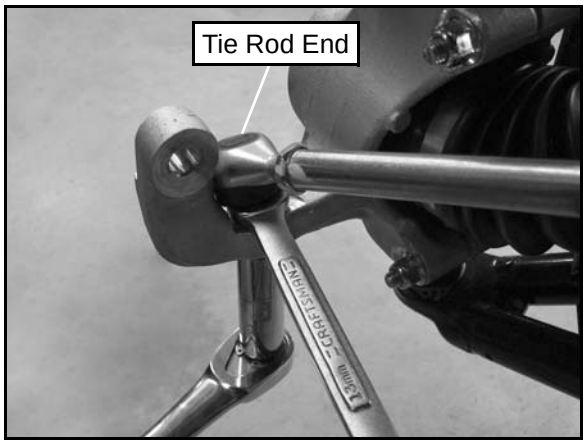
2. Check bearings for side play by grasping the top and bottom of the tire firmly and checking for movement. The tire should rotate smoothly without binding or rough spots.
3. Remove the (4) wheel nuts and remove the front wheel (see "Wheel Removal").
4. Remove the cotter pin and loosen the front wheel hub castle nut. Remove the nut and (2) cone washers from the front wheel hub assembly.



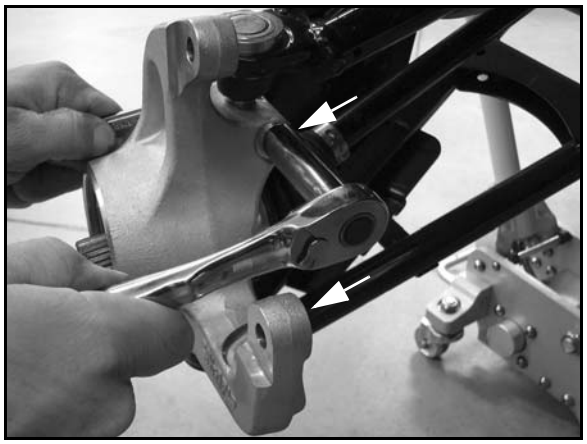
5. Remove the (2) brake caliper mounting bolts and caliper. **CAUTION:** Do not hang the caliper by the brake line. Use wire to hang caliper to prevent damage to the brake line.



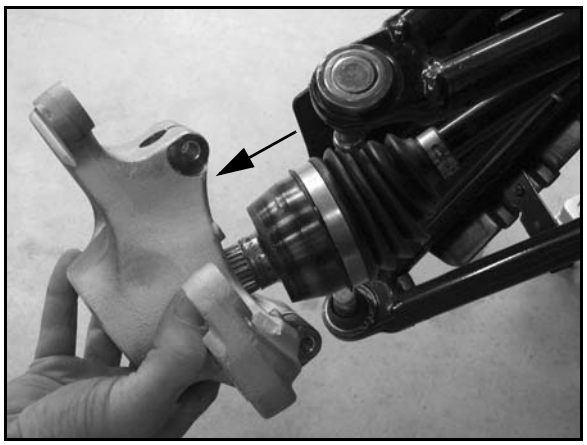
6. Remove the front wheel hub assembly.
7. Remove the cotter pin from the bottom of the tie rod end.
8. Hold the top of the rod end with a 13 mm open-end wrench and remove the nut from the bottom.



9. Remove the steering tie rod from the bearing carrier.
10. Remove the upper and lower ball joint pinch bolts.



11. Using a soft faced hammer, lightly tap on the bearing carrier while removing the upper and lower ball joint ends.
12. Remove the bearing carrier from the front drive shaft.



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13. Rotate bearing by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion.

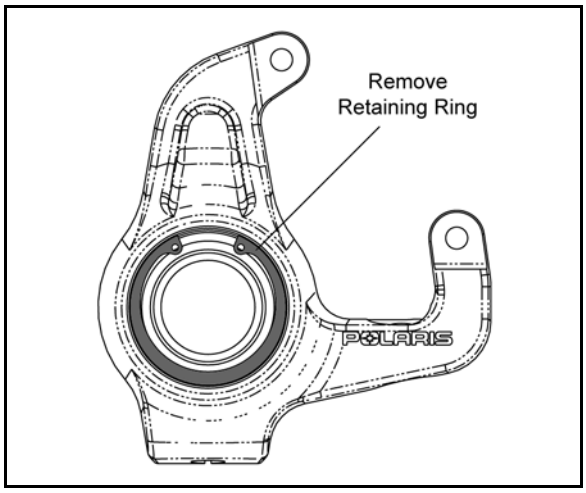
NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement sideways between inner and outer race.

14. Replace bearing if moisture, dirt, corrosion, or roughness is evident.

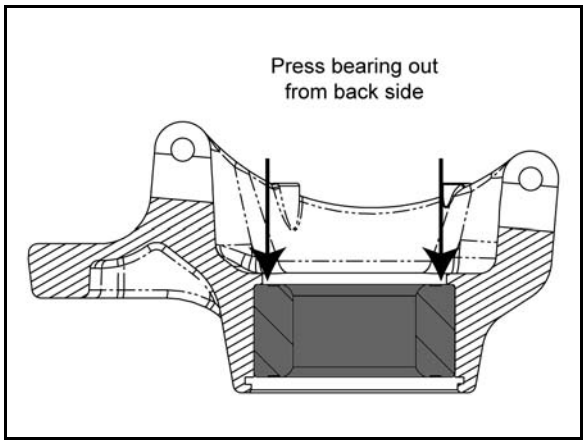
Bearing Replacement

Bearing Removal

1. Remove the outer retaining ring from the bearing carrier.



2. Support the bearing carrier in an arbor press and remove the bearing by pressing it out from the back side.



3. Inspect the bearing carrier housing for scratches, wear or damage. Replace front bearing carrier if damaged.

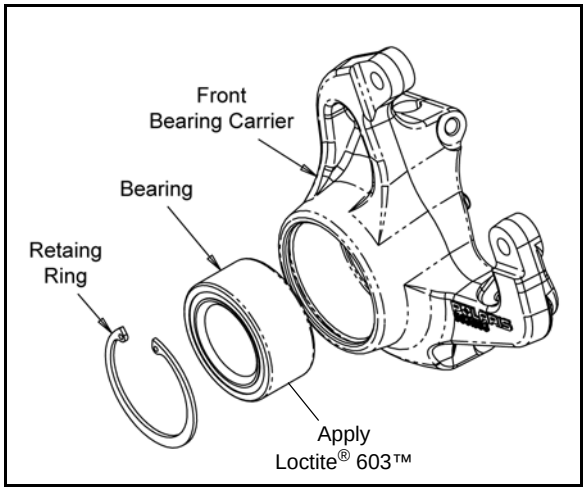
Bearing Installation

4. Thoroughly clean the front bearing carrier housing and the outer race on the new bearing. Be sure that all oil residue has been removed from each surface.

5. Support the bottom of the bearing carrier housing.

> **⚠ CAUTION**
>
> Use an arbor and press only on the outer race or bearing damage may occur.

6. Apply **Loctite® 603™** retaining compound to the outer circumference of the new bearing race and carefully press the new bearing into the bearing carrier housing.



NOTE: Use care to not allow any of the Loctite® compound to get in the bearing.

7. Wipe the housing clean of any excess compound and install the snap ring.

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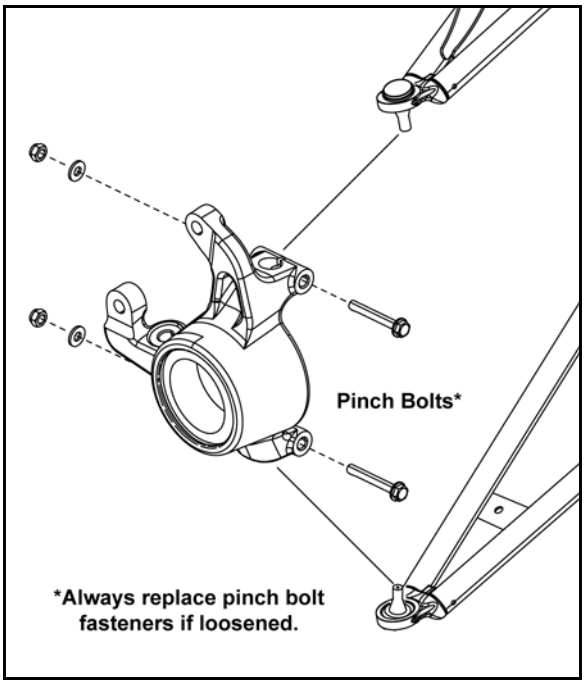
Installation

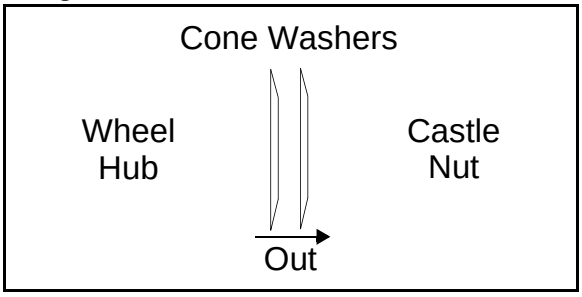
1. Install the drive shaft axle through the backside of the bearing carrier.
2. Install the upper and lower ball joint ends into the bearing carrier.
3. Install new pinch bolts and fastener hardware. Torque new pinch bolts to specification.

NOTE: Refer to the Polaris Electronic Parts Catalog for replacement pinch bolts and fastener hardware.



= T
Pinch Bolts: **New: 17 ft. lbs. (23 Nm) + 1/4 Turn (90°)**

4. Apply grease to drive shaft axle splines.
5. Install the front wheel hub assembly, cone washers, and hand tighten the castle nut. Install washers with domed side facing out toward the castle nut.

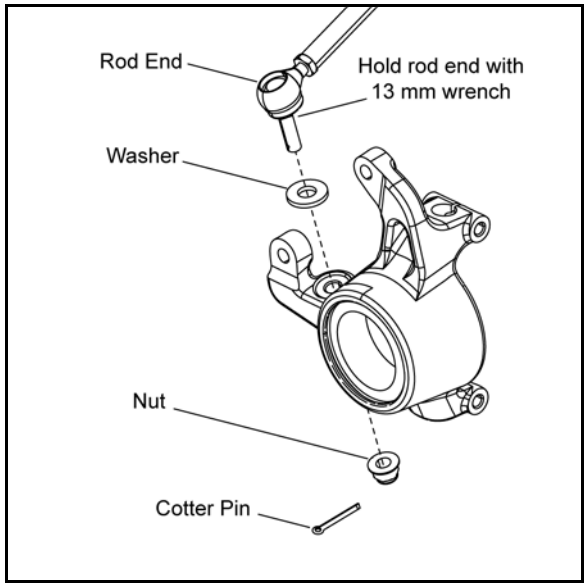


6. Install the brake caliper and torque the new mounting bolts to specification.

= T
Front Caliper Mounting Bolts: **37 ft. lbs. (50 Nm)**

CAUTION
New bolts have a pre-applied locking agent which is destroyed upon removal. Always use new brake caliper mounting bolts upon assembly.

7. Install the steering tie rod end onto the front bearing carrier. Torque fastener to specification and install a new cotter pin.



= T
Tie Rod End Fastener: **44 ft. lbs. (60 Nm)**

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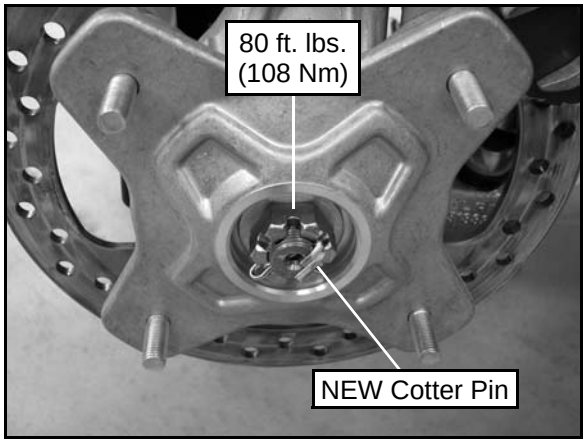
8. Torque the wheel hub castle nut to specification and install a NEW cotter pin. Tighten nut slightly if necessary to align cotter pin holes.



= T
Wheel Hub Castle Nut: **80 ft. lbs. (108 Nm)**

9. Install the front wheel and (4) wheel nuts. Torque wheel nuts to specification.

= T
Wheel Nuts: **Steel Wheels: 45 ft. lbs. (61 Nm)** **Aluminum Wheels: 75 ft. lbs. (102 Nm)**

10. Rotate wheel and check for smooth operation. Bend both ends of cotter pin around end of spindle in different directions.

FRONT DRIVE SHAFT

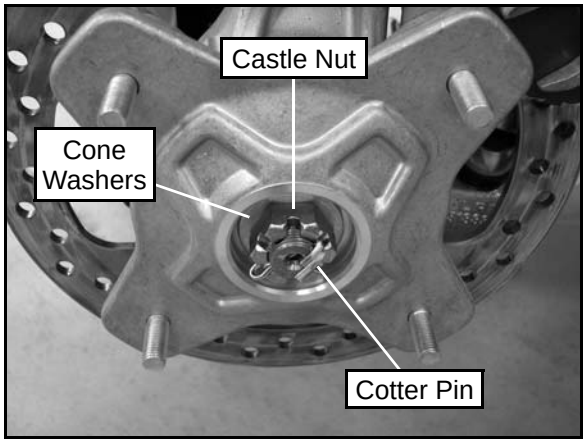
Removal

1. Elevate front of vehicle and safely support machine under the frame area.

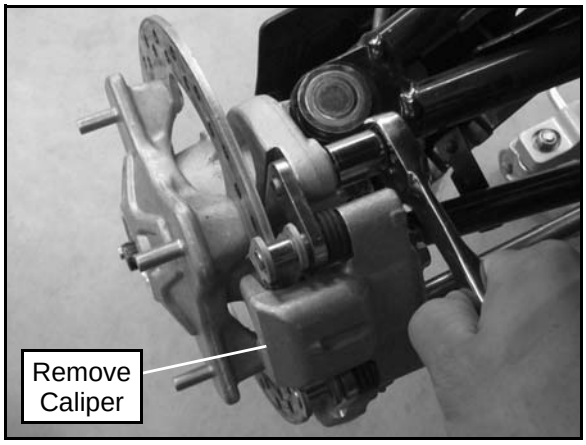
> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

2. Remove the (4) wheel nuts and remove the front wheel (see "Wheel Removal").

3. Remove the cotter pin and loosen the front wheel hub castle nut. Remove the nut and (2) cone washers from the front wheel hub assembly.



4. Remove the (2) brake caliper mounting bolts and caliper. **CAUTION:** Do not hang the caliper by the brake line. Use wire to hang caliper to prevent damage to the brake line.



5. Remove the front wheel hub assembly.

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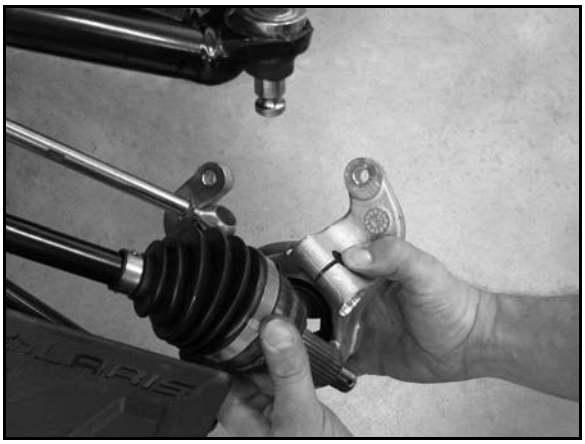
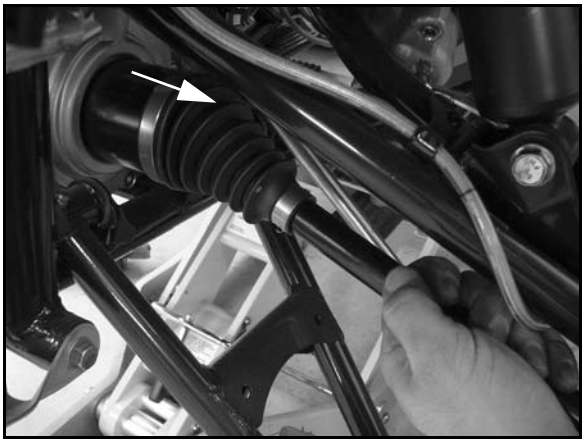
6. Remove the upper ball joint pinch bolt.

7. Using a soft faced hammer, lightly tap on the upper A-arm to remove it from the bearing carrier.

8. Remove the drive shaft from the front bearing carrier.



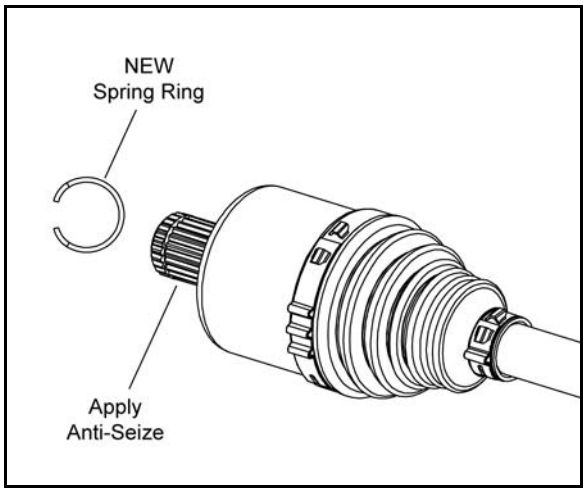
9. With a short, sharp jerk, remove drive shaft from the front gearcase.



10. Refer to the “DRIVE SHAFT SERVICE” procedure if repairing the drive shaft.

Installation

1. Install a new spring ring on the end of the drive shaft and apply an anti-seize compound to the splines.



2. Align the splines of the drive shaft with the front gearcase and reinstall the drive shaft. Use a rubber mallet to tap on the outboard end of the drive shaft if necessary.

3. Install the drive shaft into the front bearing carrier.

4. Refer to the “FRONT BEARING CARRIER - Installation” procedure within this chapter to properly reassemble the vehicle.

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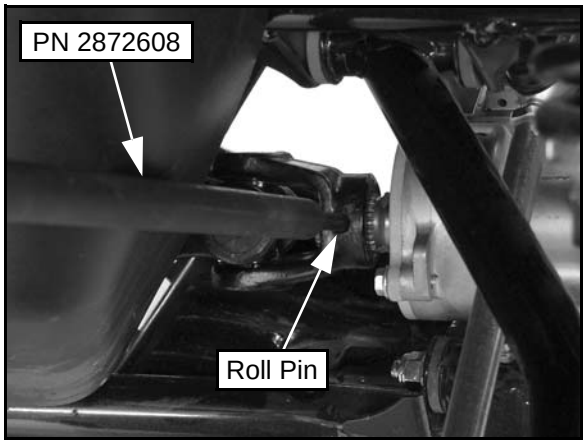
FRONT PROPSHAFT

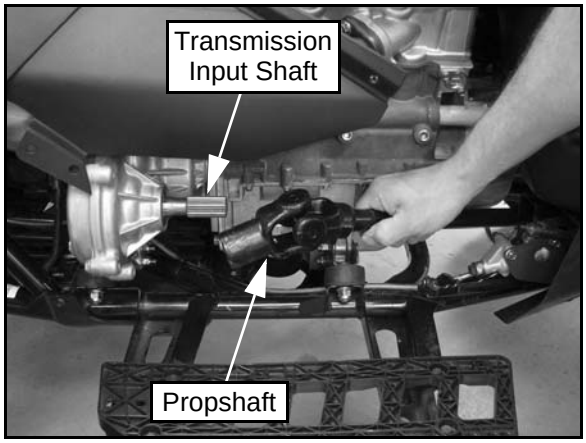
Removal

1. Locate the front propshaft roll pin through the right front wheel well. Position the vehicle for roll pin removal.
2. Use the Roll Pin Removal Tool (**PN 2872608**), to drive out the roll pin from the front propshaft.



Roll Pin Removal Tool (PN 2872608)

3. Remove the seat, upper right side panel and right footwell.
4. Pull the shaft back towards the transmission to remove it from the front gearcase input shaft, then pull it forward to remove it from the transmission output shaft.



Installation

1. Apply anti-seize compound to all splines. Slide propshaft back onto the transmission output shaft, then slide it up onto the front gearcase input shaft, verify pin holes are aligned.
2. Using Roll Pin Tool (**PN 2872608**), install a NEW roll pin (spring pin) into the propshaft.
3. Reinstall the footwell, side panel and seat (see Chapter 9).

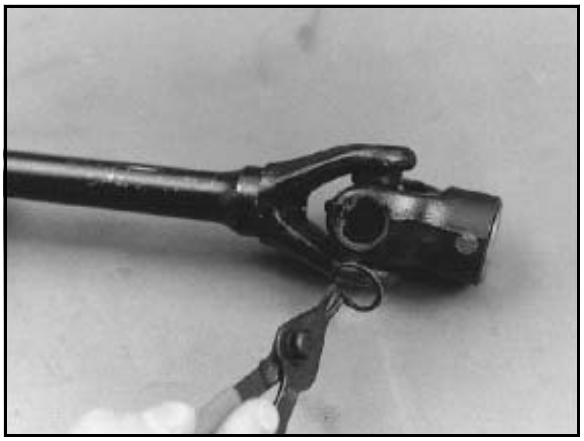
PROPSHAFT U-JOINT SERVICE

Disassembly

1. Remove internal or external snap ring from bearing caps.

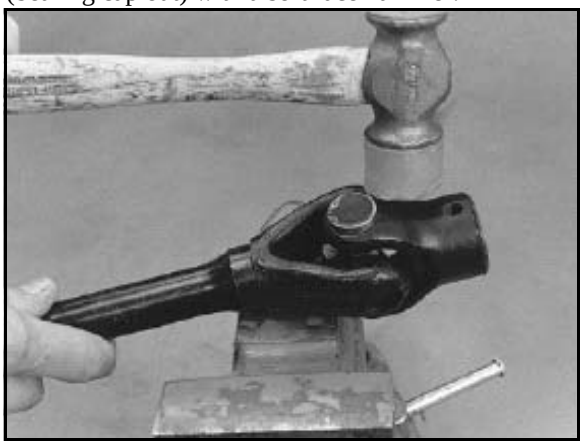
⚠ CAUTION

Always wear eye protection.



NOTE: If yoke or bearing is removed, cross bearing must be replaced. Note orientation of grease fitting and mark inner and outer yoke for correct re-positioning during installation.

2. Support inner yoke as shown and drive outer yoke down (bearing cap out) with a soft face hammer.



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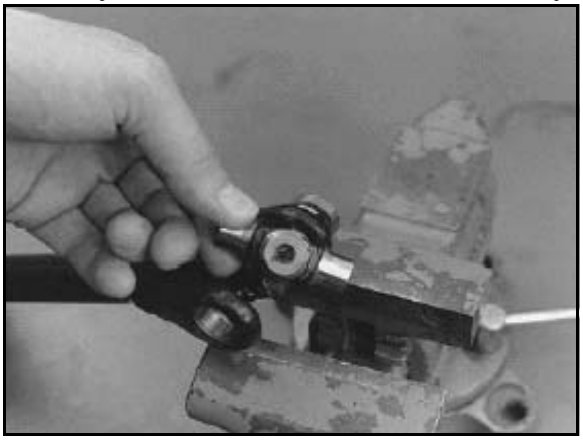
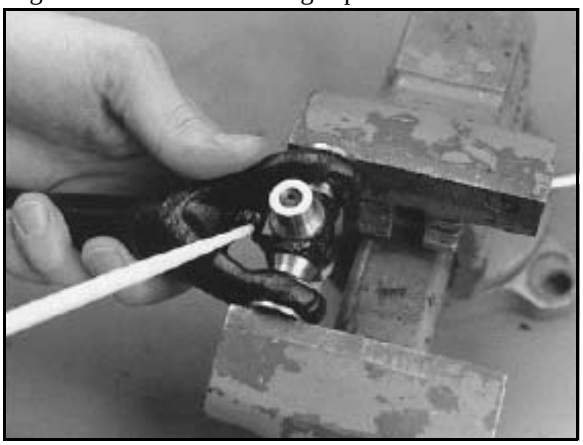
3. Support U-joint in vise as shown and drive inner yoke down to remove remaining bearing caps.

4. Force U-joint cross to one side and lift out of inner yoke.

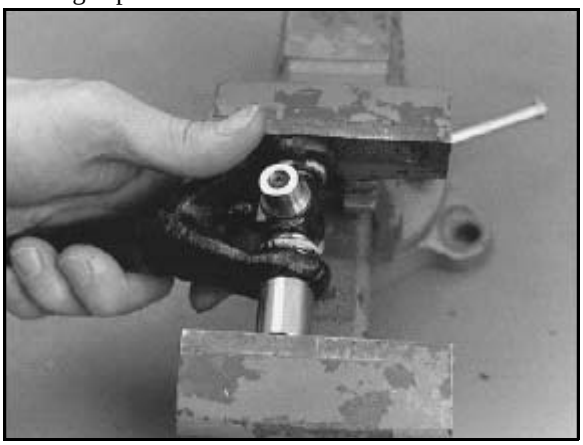


Assembly

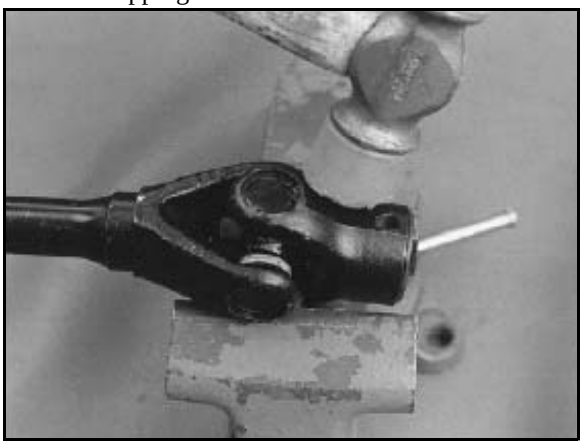
1. Install new bearing caps in yoke by hand. Carefully install U-joint cross with grease fitting properly positioned inward toward center of shaft. Take care not to dislodge needle bearings upon installation of cross joint.
2. Tighten vise to force bearing caps in.



3. Using a suitable arbor, fully seat the bearing cap in one side. Continually check for free movement of bearing cross as bearing caps are assembled.



4. Install snap ring to contain bearing cap just installed. Repeat procedure for other side.
5. Install outer yoke, aligning marks made at disassembly and repeat Steps 1-3 to install bearing caps on outer yoke.
6. Seat all bearing caps against snap rings by supporting cross shaft and tapping on each corner as shown.



7. When installation is complete, yokes must pivot freely in all directions without binding. If the joint is stiff or binding, tap the yoke lightly to center the joint until it pivots freely.

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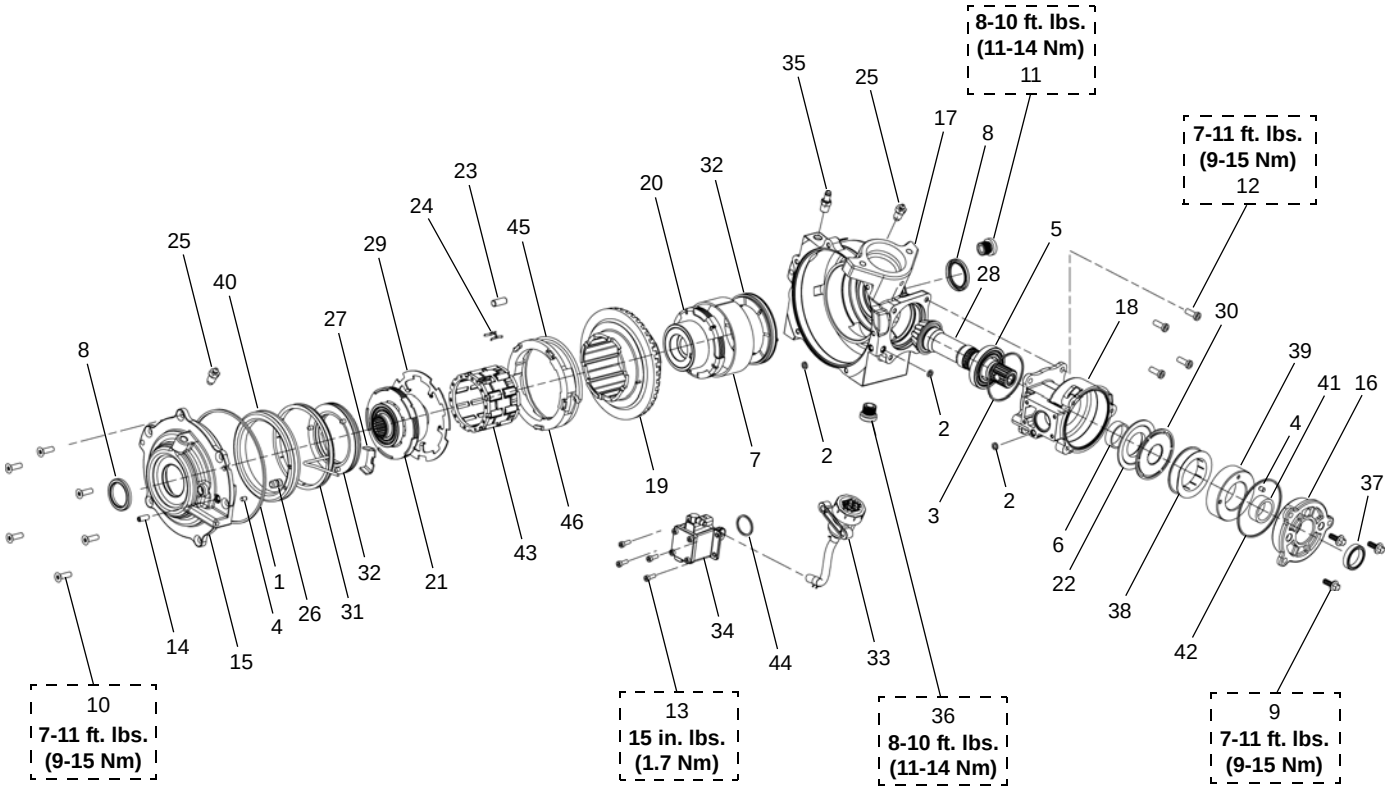
FRONT GEARCASE - CENTRALIZED HILLIARD

Exploded View



REF#	DESCRIPTION	QTY	REF#	DESCRIPTION	QTY
1	O-Ring	1	24	H-Clip Spring	20
2	O-Ring	3	25	Bleeder Screw	2
3	O-Ring	1	26	Thrust Button Assembly	1
4	Dowel Pin	2	27	Thrust Plate	1
5	Bearing	3	28	Pinion Gear	1
6	Bushing	1	29	Armature Plate (AWD)	1
7	Bushing	1	30	Armature Plate (ADC)	1
8	Oil Seal	2	31	AWD Coil	1
9	Bolt, M6	3	32	Piston	2
10	Screw, M6	6	33	ADC Reservoir	1
11	Cap Plug, M16 w/O-Ring	1	34	Pump Assembly	1
12	Cap Screw, M6	4	35	Vent	1
13	Screw, M4	6	36	Drain Plug, Magnetic	1
14	Set Screw, M6	1	37	Oil Seal	1
15	Output Cover Assembly	1	38	ADC Coil	1
16	Pinion Cover	1	39	Coil Pocket Insert (ADC)	1
17	Gearcase	1	40	Coil Pocket Insert (AWD)	1
18	Pinion Neck Housing	1	41	Bearing, Needle	1
19	Clutch Housing	1	42	O-Ring	1
20	Hub Assembly (female)	1	43	Roll Cage Assembly	1
21	Hub Assembly (male)	1	44	O-Ring	1
22	Cam	1	45	Torsion Spring	1
23	Roller	20	46	Spring Retainer	1

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AWD Operation

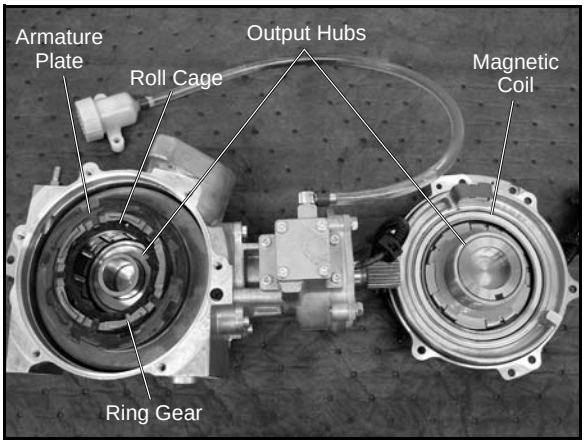
The AWD switch may be turned on or off while the vehicle is moving, however, AWD will not enable until the engine RPM drops below 3100. Once the AWD is enabled, it remains enabled until the switch is turned off.

Engage the AWD switch before getting into conditions where the front wheel drive may be needed. If the rear wheels are spinning, release the throttle before switching to AWD.

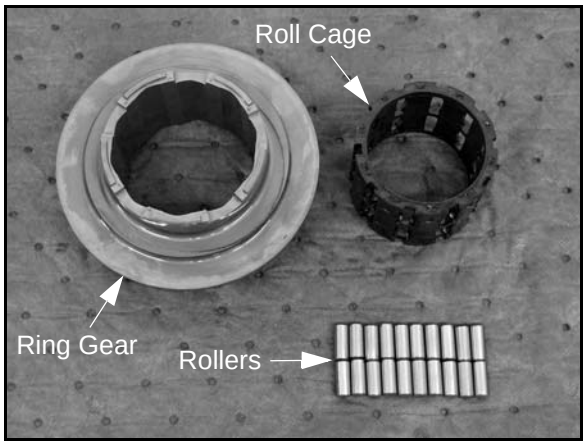
⚠ CAUTION

Switching to AWD while the rear wheels are spinning may cause severe drive shaft and gearcase damage. Always switch to AWD while the rear wheels have traction or are at rest.

With the AWD switch off, the vehicle drives through the rear wheels only (2 wheel drive). When the AWD is enabled, the front drive acts as an on-demand AWD system. This means, the front drive will engage once the rear wheels have lost traction, and will remain engaged until the torque requirement goes away (i.e. rear wheels regain traction).



AWD Engagement: When the AWD switch is activated, the AWD coil is powered by a 12 Vdc input which creates a magnetic field. This magnetic field attracts an armature plate that is keyed to the roll cage. When the ring gear and roll cage are spinning (vehicle is moving), the energized coil and armature plate will apply drag to the roll cage that indexes the rollers inside the ring gear to an engagement position. While in the engagement position, the front drive will be in an "over-running" condition (not engaged), until the rear wheels lose traction. Once the rear wheels begin to lose traction, the front drive will engage by coupling the output hubs to the ring gear via the rollers. The front drive will remain engaged until the torque requirement goes away (i.e. rear wheels regain traction).

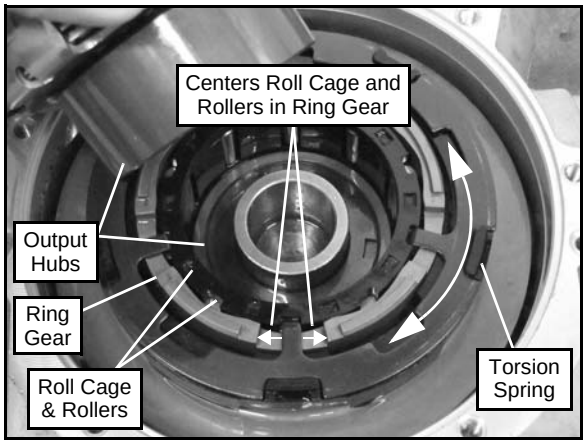


⚠ CAUTION

If the rear wheels are spinning, release the throttle before turning the AWD switch on. If AWD is engaged while the wheels are spinning, severe drive shaft and clutch damage could result.

AWD Disengagement: Once the rear wheels regain traction, the front wheels will return to the "over-running" condition. The vehicle is now back to rear wheel drive until the next loss of rear wheel traction occurs.

Torsion Spring Operation: The torsion spring acts as a return mechanism to help disengage the coupling of the output hubs and ring gear by creating an "over-running" condition for the rollers upon disengagement.



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ADC Operation

Engaging the Front Gearcase: Active Descent Control (ADC) is controlled by the ECU and will not enable until the following conditions are met:

- Vehicle speed is below 15 mph (24 kph)
- Throttle Position Sensor (TPS) is at idle position
- The AWD switch is switched to the “ADC” position

Once the conditions are met for engagement, ADC remains engaged as long as the conditions are met.

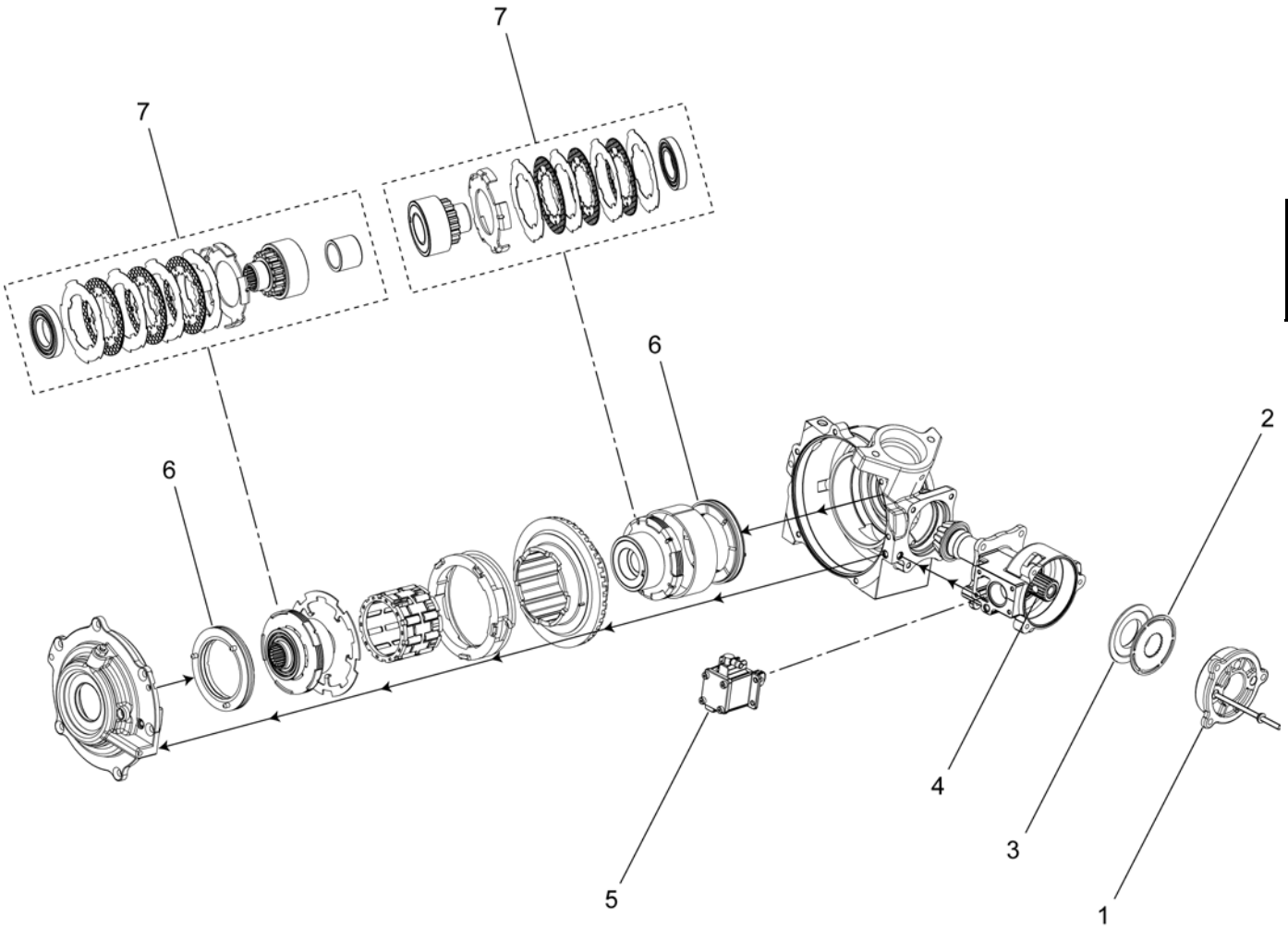
With the AWD switch set to “2x4”, the vehicle drives only the rear wheels (2 wheel drive). When the AWD switch is set to “4x4”, the vehicle drives all four wheels (4 wheel drive). When the AWD switch is set to “4x4/ADC”, the vehicle drives all four wheels and, in addition to the rear wheel engine braking, the ADC coil provides front wheel engine braking at speeds less than 15 mph (24 kph) with the TPS at idle position.

ADC Engagement: When the AWD switch is set to “4x4/ADC”, a 12 Vdc current is present at the input shaft coil ***(1)***. Operation is controlled by the ECU grounding and ungrounding the coil. The coil’s magnetic field attracts a splined armature plate ***(2)*** on the pinion (input) shaft ***(4)***. The energized splined armature plate attracts the unsplined eccentric cam ***(3)***, which begins to turn with the input shaft. The eccentric cam drives a hydraulic piston/pump assembly ***(5)***. The pressure created by the pump assembly forces hydraulic fluid through passages to the piston assemblies ***(6)*** located in each case half. Hydraulic pressure forces the piston assemblies inward to compress the splined clutch packs ***(7)*** forming a dynamic coupling to each front drive axle, resulting in true all-wheel EBS operation upon deceleration.

Disengagement: Current to the ADC coil is turned off by the ECU anytime the following conditions are met:

- Throttle Position Sensor (TPS) moves off idle position
- The AWD switch is switched to “4x4”, “2x4” or “Turf”
- Vehicle speed is above 15 mph (24 kph)

Hydraulic pressure stops and the pistons release, disengaging the ADC function.



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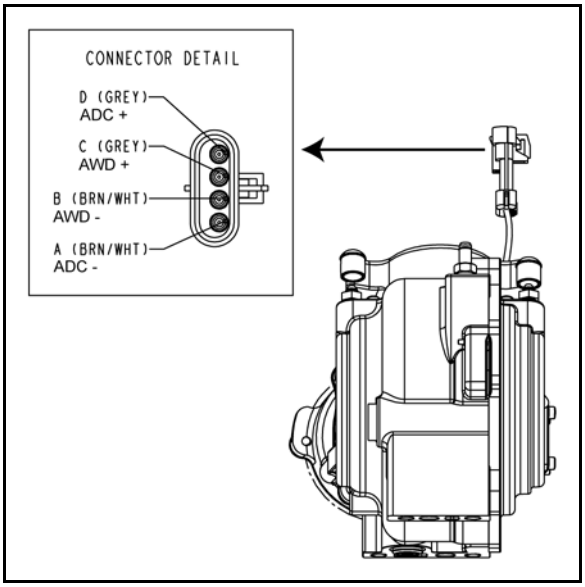
AWD Diagnosis

Symptom: AWD Will Not Engage

1. Check the gearcase AWD coil resistance. Measure between the Grey (C) and Brown/White (B) wires. The resistance value should be within specification.



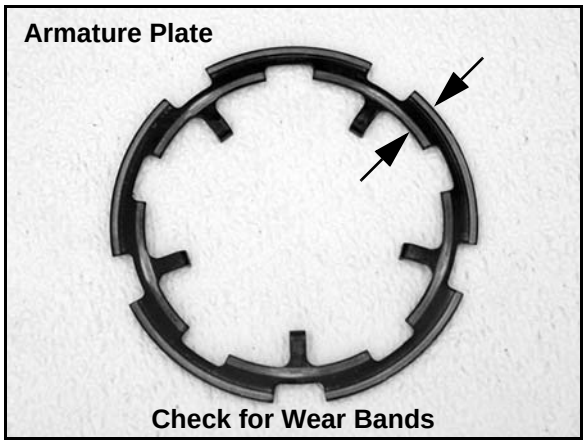
Front Gearcase Coil Resistance:

AWD (Pin B to Pin C): 24 Ω
ADC (Pin A to Pin D: 12 Ω

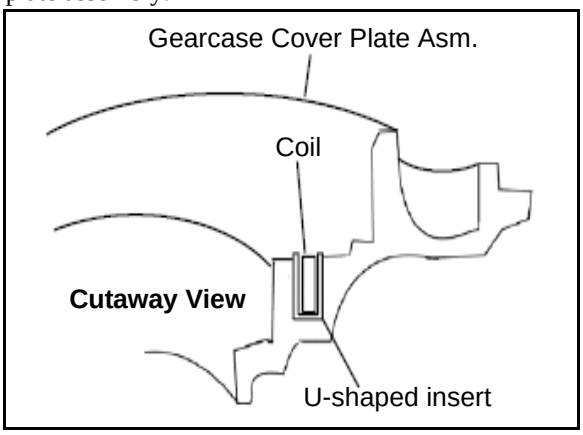
2. Turn on the ignition switch and AWD switch and place gear selector in High or Low gear. Check for minimum battery voltage at the chassis-side of the AWD/ADC connector. Measure between the Gray (C) and Brown/White (C) chassis wires that power the AWD coil. A minimum of 11 Vdc should be present.

3. If electrical tests are within specification, remove the front gearcase (see "Gearcase Removal") and inspect the internal components.

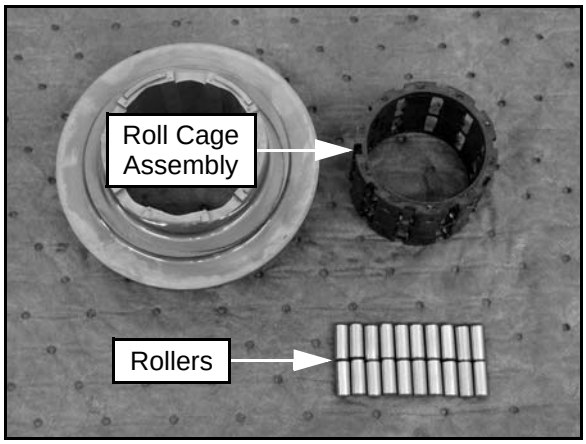
4. Inspect the armature plate for a consistent wear pattern. There should be two distinct wear bands (one band inside the other). If only one band of wear is present or if there is wear between the two bands, inspect the coil area as indicated in Step 5. A wear band with an interrupted wear mark may indicate a warped plate, which may cause intermittent operation.



5. Check to make sure the AWD coil is seated in the U-shaped insert that is pressed into the gearcase cover. The top of the coil should be seated below the U-shaped insert. If the top of the coil is above the surface of the U-shaped insert it raises the armature plate, thereby increasing pole gap. If the pole gap increases, the coil will not be strong enough to engage the AWD system. If this is found, replace the cover plate assembly.



6. Inspect the rollers for nicks and scratches. The rollers must slide freely within the roll cage and H-springs.



7. Inspect the roll cage assembly for cracks or excessive wear. If damaged, replace the roll cage assembly.

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Gearcase Removal (Non-EPS Models)

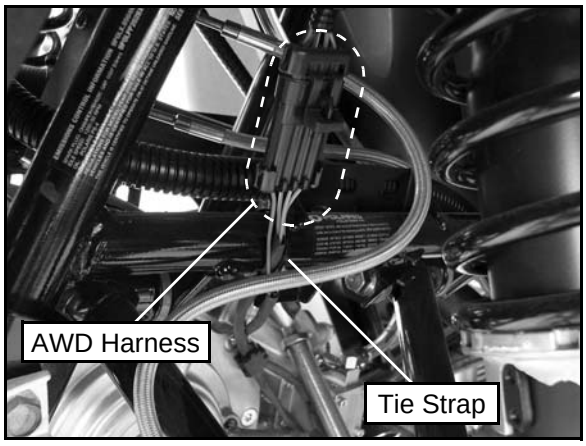
1. Stop engine and place gear selector in Park.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

2. Remove both front drive shafts from the front gearcase (see "FRONT DRIVE SHAFT - Removal").

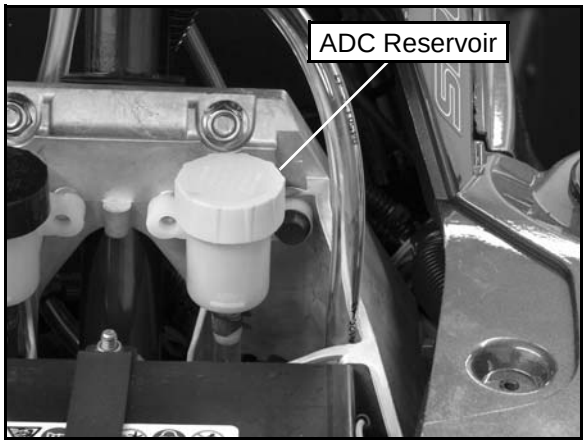
3. Remove the front propshaft from the front gearcase input shaft (see "FRONT PROPSHAFT - Removal").

4. Disconnect the wire harness above the front gearcase and remove the plastic tie strap retaining the wires to the frame.

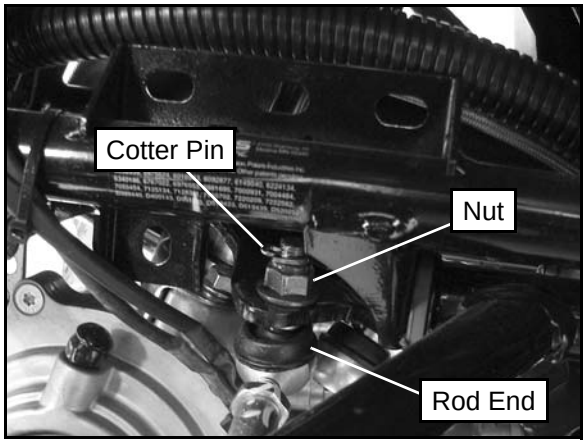


5. Remove the front rack or front storage box to gain access to the ADC reservoir.

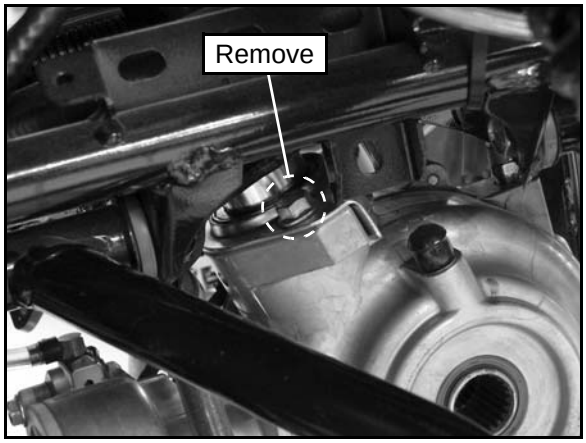
6. Remove the screw retaining the ADC reservoir to the frame and pull the reservoir and clear hose out from the frame so it can be removed with the front gearcase.



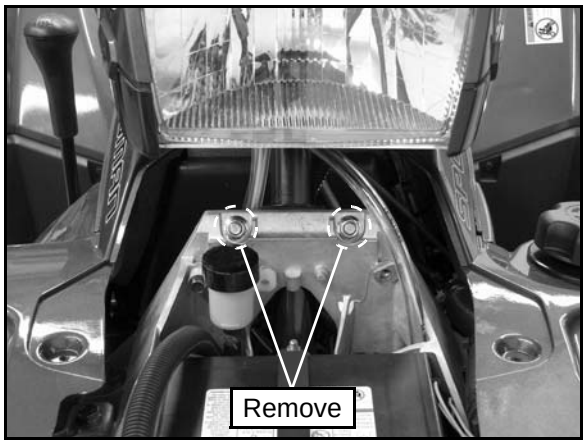
7. Remove the cotter pin and nut from each tie rod end at the steering post frog.



8. Remove the (2) bolts retaining the lower steering post bracket to the front gearcase.



9. Remove the front cover and remove the (2) fasteners retaining the upper steering post bushing bracket.



10. Lift the steering post assembly up from the front gearcase. Position the steering post toward the center of the vehicle to allow enough room for gearcase removal.

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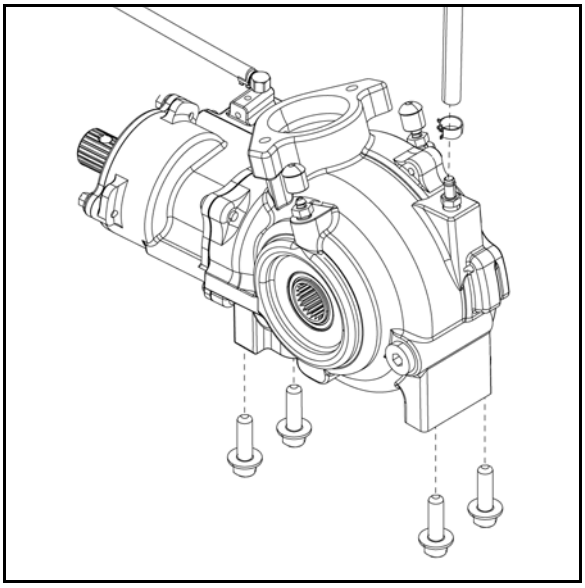
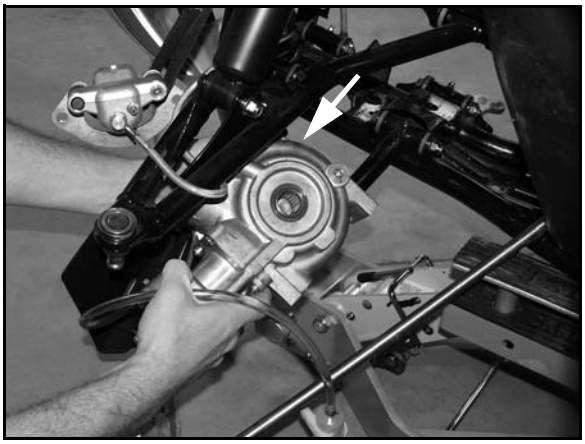
11. Remove the vent line and the (4) bolts securing the front gearcase to frame.



12. Lay the gearcase on its side (ADC pump side down) and rotate it in the frame so the input shaft is facing you.

13. Remove the gearcase from the front LH wheel well area and carefully slide it between the upper and lower A-arms.



Gearcase Removal (EPS Models)

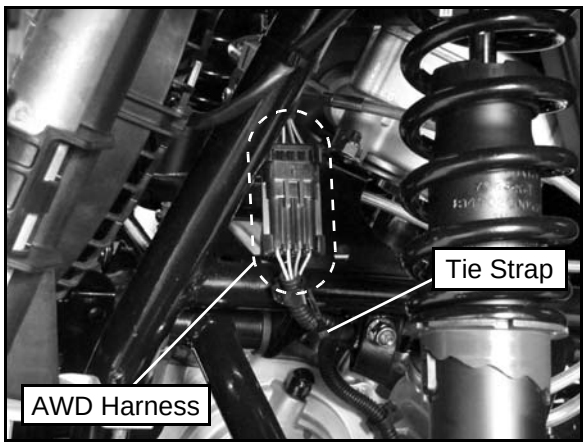
1. Stop engine and place gear selector in Park.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

2. Remove both front drive shafts from the front gearcase (see "FRONT DRIVE SHAFT - Removal").

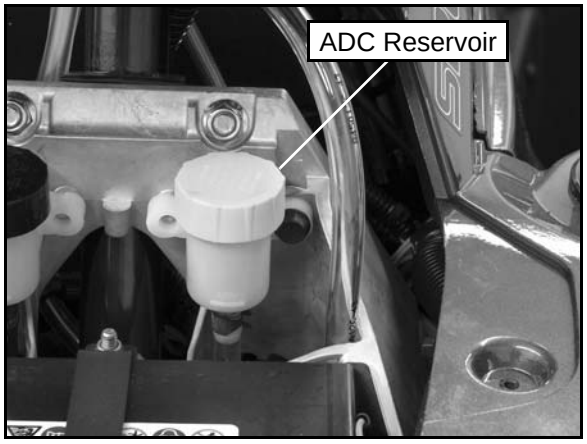
3. Remove the front propshaft from the front gearcase input shaft (see "FRONT PROPSHAFT - Removal").

4. Disconnect the wire harness above the front gearcase and remove the plastic tie strap retaining the wires to the frame.

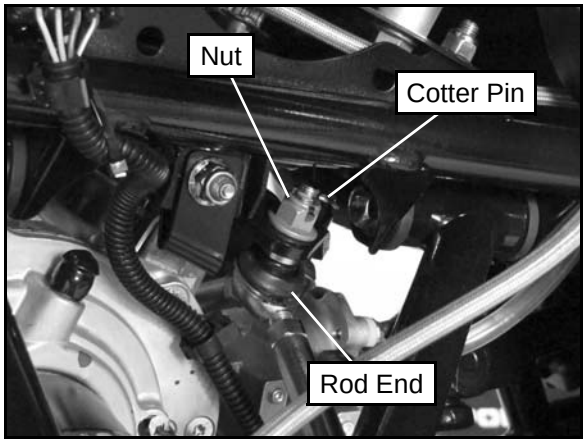


5. Remove the front rack to gain access to the ADC reservoir.

6. Remove the screw retaining the ADC reservoir to the frame and pull the reservoir and clear hose out from the frame so it can be removed with the front gearcase.



7. Remove the cotter pin and nut from each tie rod end at the steering post frog.



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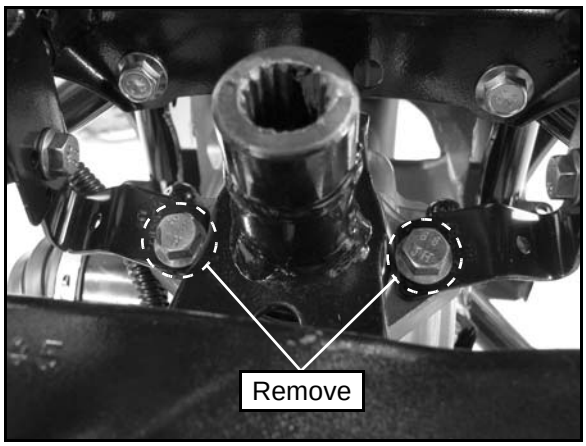
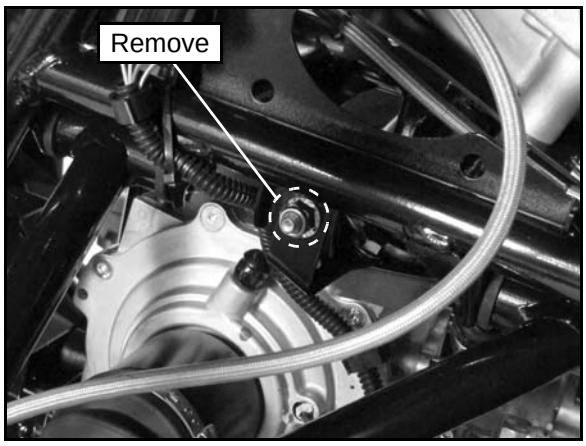
8. Remove the power steering unit from the vehicle. Refer to Chapter 10 “Power Steering Unit Removal”.

9. Remove the (2) bolts retaining the lower steering post assembly and bracket to the front gearcase.

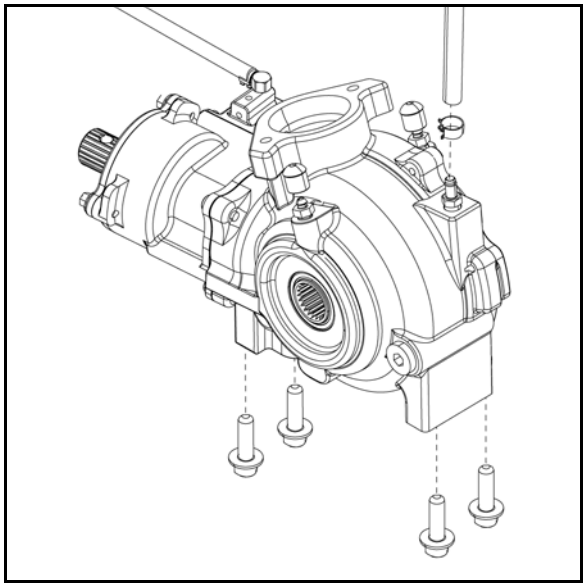


10. Remove the (2) bolts retaining the front gearcase brackets to the frame on each side.



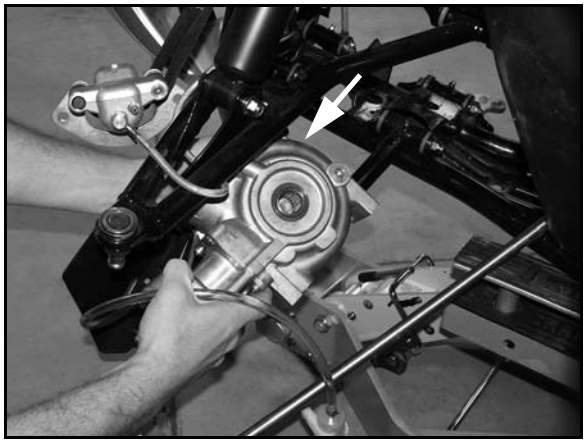
11. Lift the lower steering post assembly from the front gearcase and out from the vehicle.

12. Remove the vent line and the (4) bolts securing the front gearcase to frame.



13. Lay the gearcase on its side (ADC pump side down) and rotate it in the frame so the input shaft is facing you.

14. Remove the gearcase from the front LH wheel well area and carefully slide it between the upper and lower A-arms.



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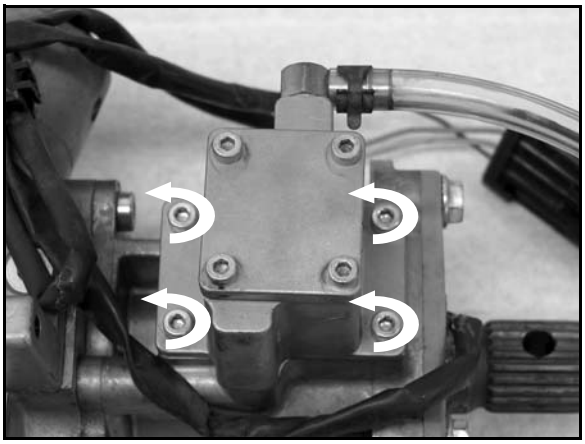
Gearcase Disassembly / Inspection

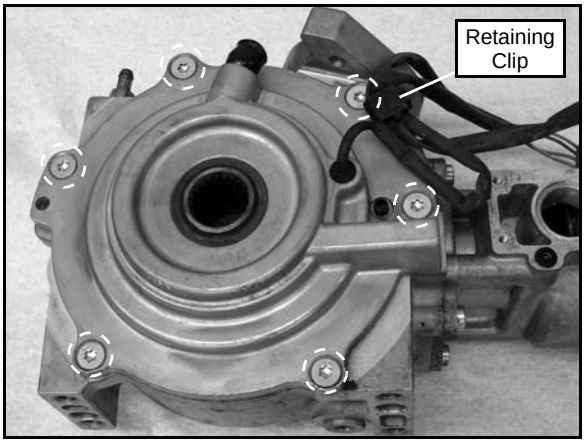
1. Drain and properly dispose of used lubricant. Remove any metal particles from the drain plug magnet.

2. Remove the (4) screws retaining the piston pump assembly to the gearcase and remove the pump.

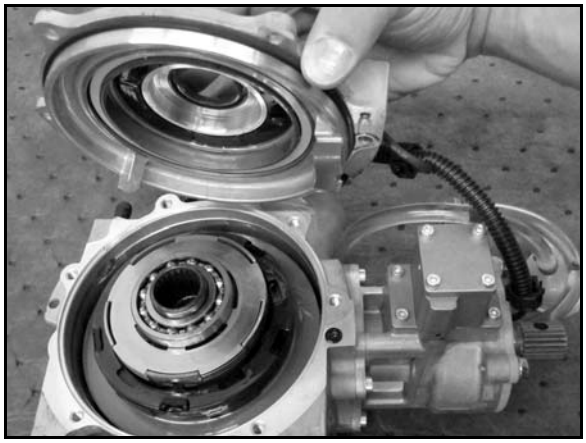


NOTE: Piston pump assembly is a non-serviceable item and should not be disassembled. Replace as an assembly if found to be damaged or non-working.

3. Remove the (6) screws retaining the cover plate assembly and open the wire retaining clip.

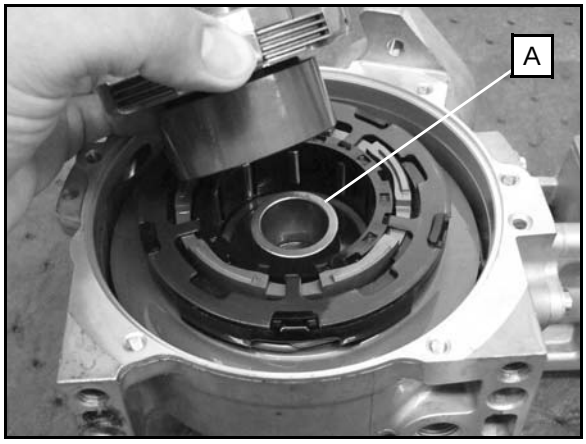


4. Remove the cover plate assembly from the gearcase.



5. Remove the female (LH) output hub assembly. Inspect the thrust bearing (A) for wear. Inspect the output hub ball bearings, contact surfaces and splines for signs of wear or damage. Visually inspect the clutch plate area. If plates are steel-on-steel, or if the friction material is worn, the assembly must be replaced.

NOTE: Thrust bearing (A) located between the two output assemblies is pressed into the clutch pack and is not removable.



NOTE: Excessive noise coming from the front drive on deceleration are key indicators of burnt or broken down front drive fluid.

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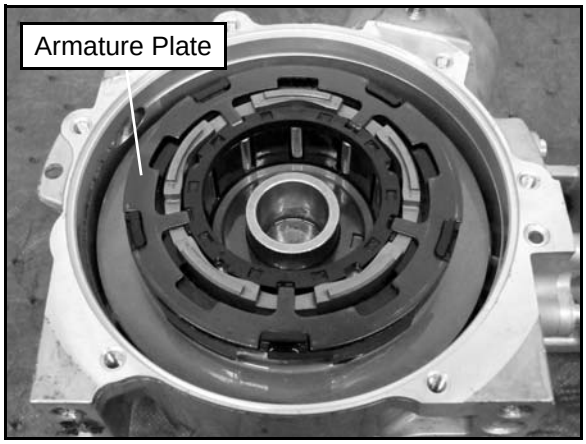
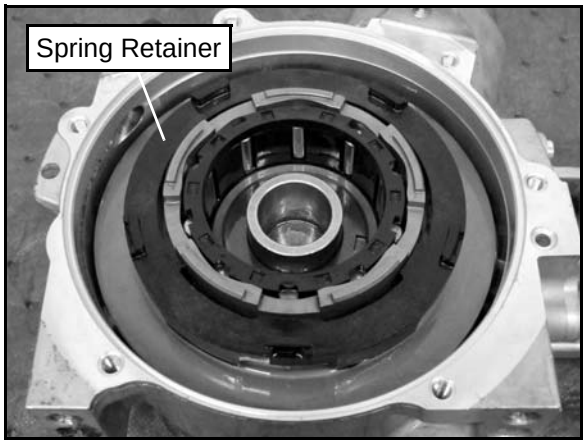
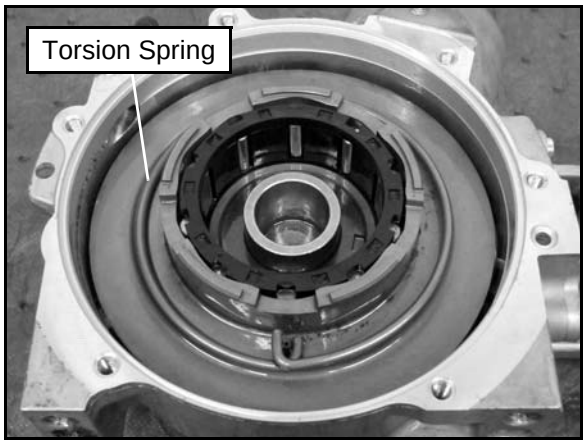
6. Remove and inspect the armature plate. Refer to "AWD Diagnosis" for detailed inspection process.

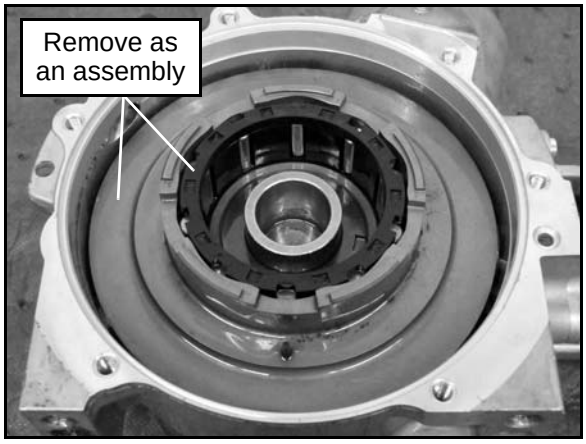


7. Remove the torsion spring retainer and torsion spring from the top of the ring gear.

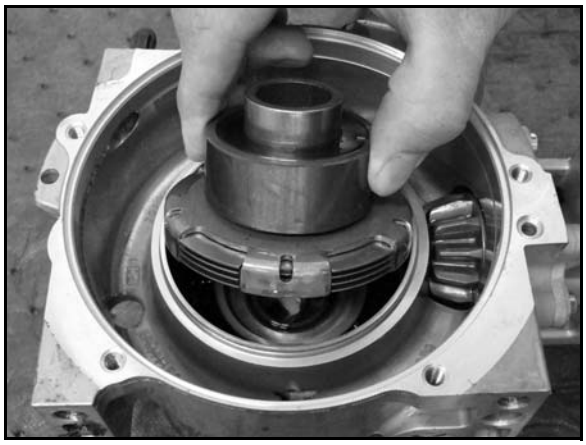




8. Remove the ring gear and roll cage assembly from the gearcase housing.



9. Remove the male (RH) output hub assembly. Inspect the bearings, contact surfaces and splines for signs of wear or damage. Visually inspect the clutch plate area. If plates are steel-on-steel, or if the friction material is worn, the assembly must be replaced.



10. Place a shop towel over the ring gear assembly and slowly remove the roll cage and rollers from the ring gear.

NOTE: Rollers are spring loaded. Take care not to allow them to fall out or lose them upon removal of the roll cage.

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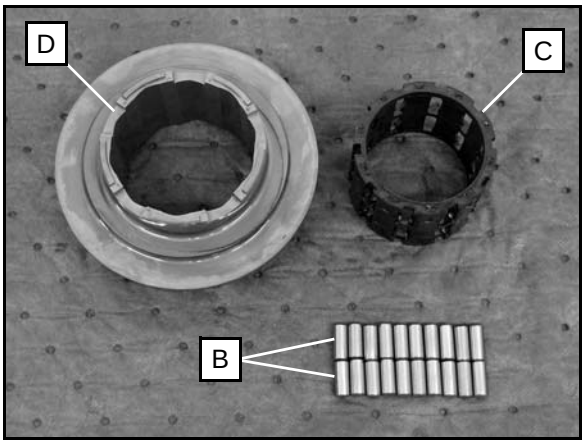
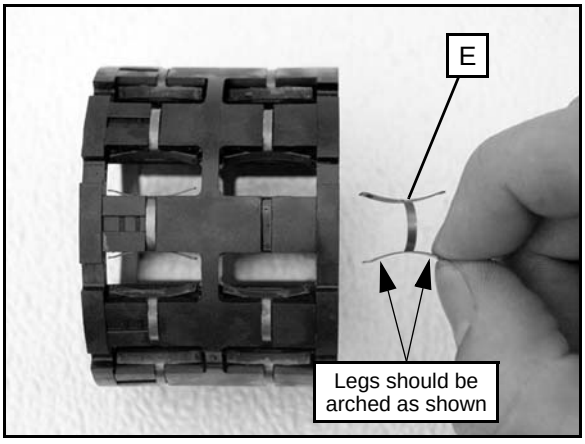
11. Inspect the rollers (B) for nicks, scratches and flat spots. Inspect the roll cage (C) for damage or cracks. The rollers must slide up and down freely within the roll cage surfaces. Inspect the ring gear (D) for consistent wear patterns. Surfaces should be free of nicks or burrs.



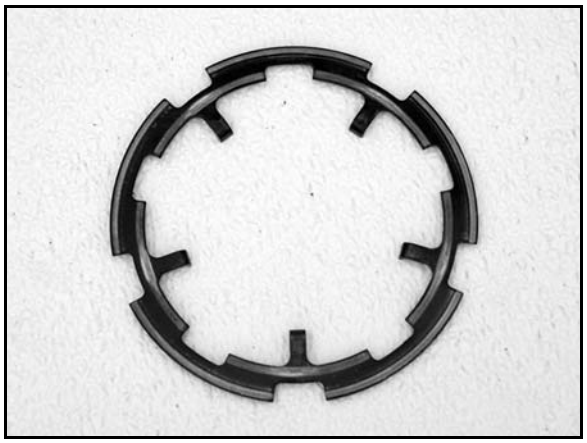
12. Inspect roll cage sliding surfaces. These surfaces must be clean and free of nicks, burrs or scratches.

13. Remove and inspect the H-springs (E). If the spring legs appear to be flattened or damaged, replace the roll cage and H-springs as an assembly.

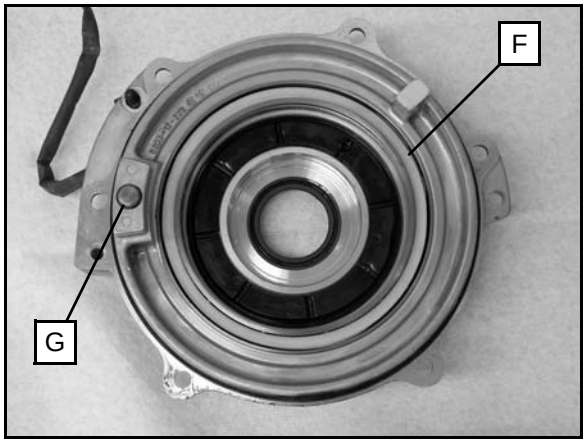


IMPORTANT: Refer to the "Electronic Parts Catalog" for individual part availability. Most parts are to be replaced as an assembly or as a complete kit.

14. Inspect the armature plate for a consistent wear pattern. Uneven wear of the armature plate indicates a warped plate, which may cause intermittent operation (refer to "AWD Diagnosis" for inspection).



15. Inspect the magnetic coil (F) in the cover plate assembly (refer to "AWD Diagnosis" for inspection).



16. Inspect the backlash thrust button (G) and thrust plate for excessive wear.

NOTE: Ring gear backlash is set at the factory. No adjustment is required unless the front cover is replaced or the backlash thrust pad screw is removed. Refer to "Setting Ring Gear Backlash" later in this chapter for details on backlash setting.

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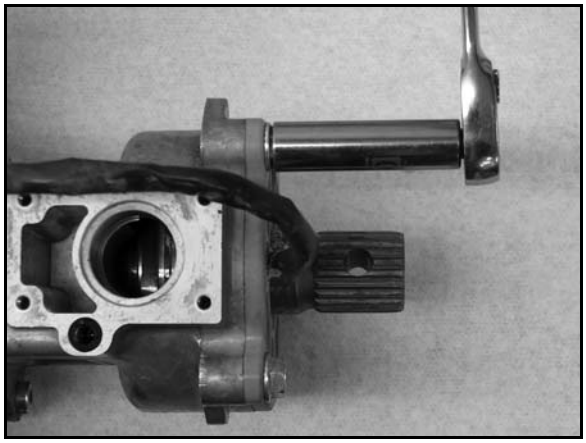
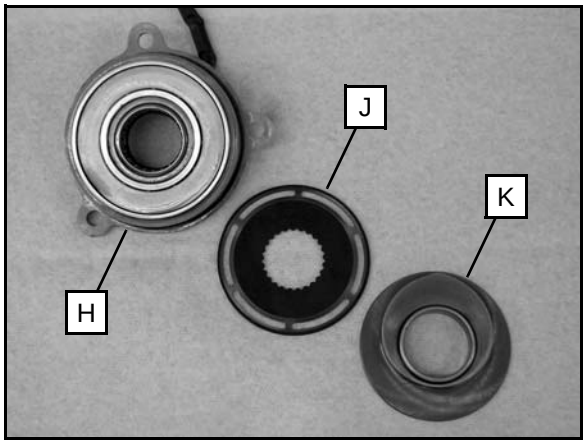
17. Remove the (3) bolts retaining the input cover.

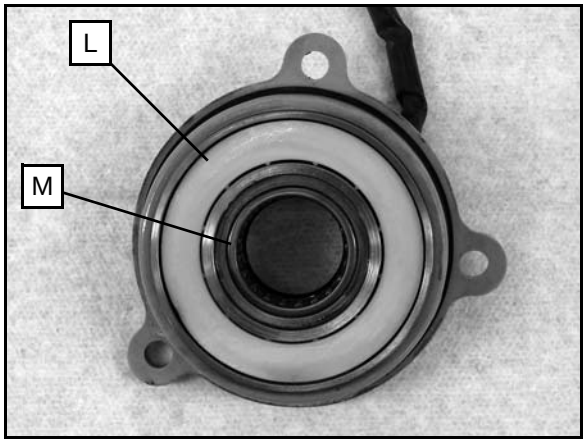


18. Remove the cover (H), armature plate (J) and cam (K).

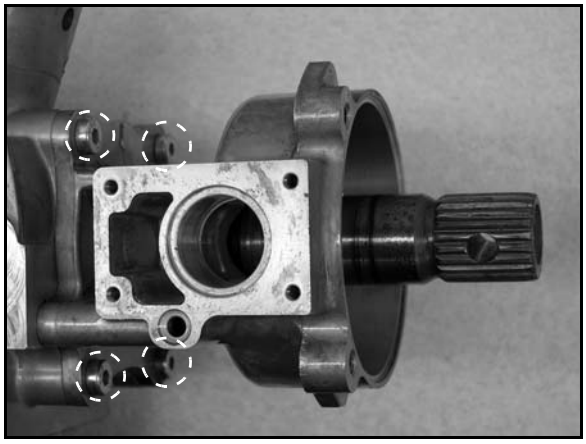


19. Inspect the armature plate (J) and cam (K) for excessive wear or damage. If replacement is required, replace the armature plate and cam as an assembly.

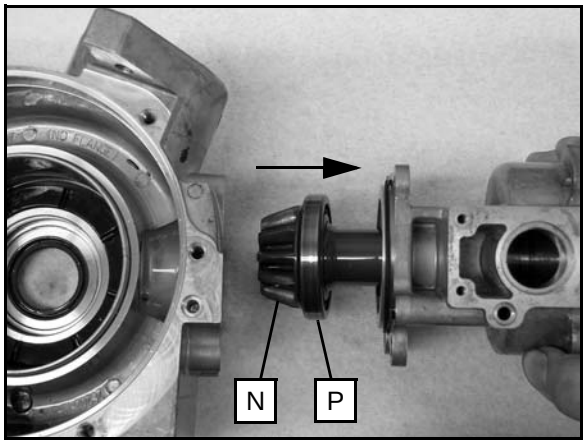
20. Inspect the magnetic coil (L) and needle bearing (M) located in the input cover assembly. If replacement is required, replace the input cover as an assembly.



21. Remove the (4) screws that retain the pump neck assembly to the main gearcase.



22. Remove the neck and input shaft assembly from the main gearcase.



23. Inspect the pinion gear (N) for chipped, broken, or missing teeth. Inspect the input shaft bearing (P) for signs of wear. The bearing can be replaced separate from the input shaft.

IMPORTANT: Refer to the "Electronic Parts Catalog" for individual part availability. Most parts are to be replaced as an assembly or as a complete kit.

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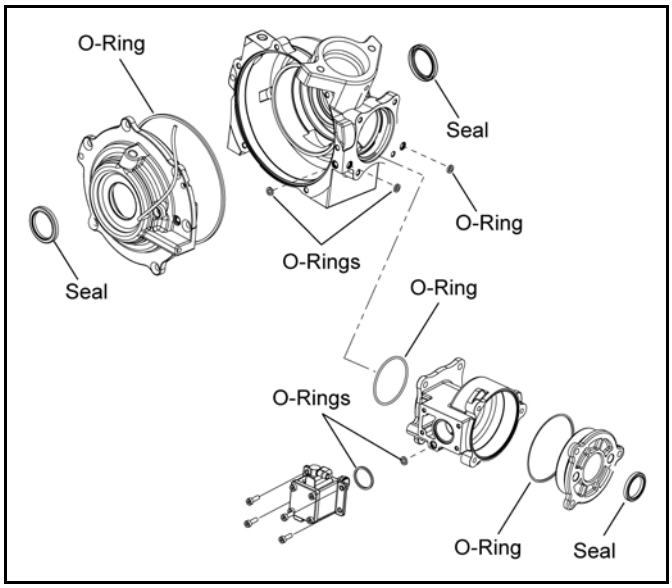
Gearcase Assembly

NOTE: Refer to the photos used in the "Gearcase Disassembly / Inspection" procedure when needed, while assembling the front gearcase.

1. Thoroughly clean all gearcase components before beginning reassembly.

2. Install new seals and O-rings as shown (included in the *Seal Repair Kit*).



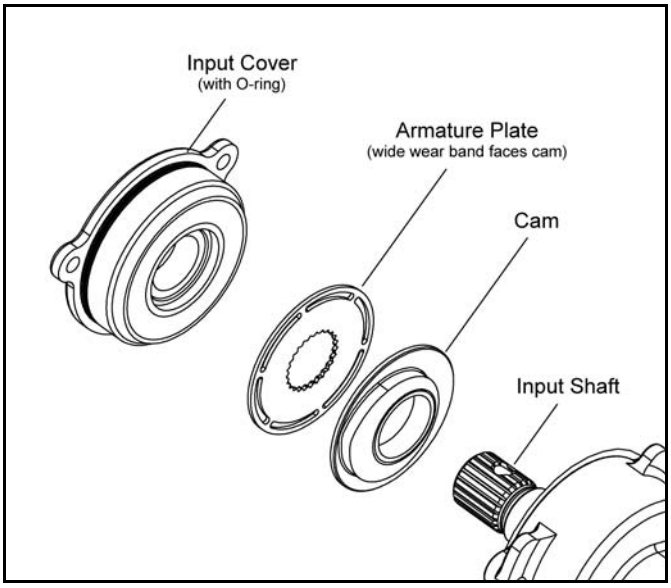
3. Apply assembly grease to the seal lips to prevent from damaging the seals upon assembly.

4. Install the input shaft assembly.

5. Install the neck onto the main gearcase using new O-rings. Torque the screws to specification.

= T
Gearcase Neck Retaining Screws: **7-11 ft. lbs. (9-15 Nm)**

6. Install the cam, armature plate and input cover assembly with a new O-ring.



7. Torque the input cover screws to specification.

= T
Input Cover Screws: **7-11 ft. lbs. (9-15 Nm)**

8. Install the roll cage and rollers into the ring gear. Insert the rollers as the roll cage is installed.

9. Hold the roll cage assembly in the ring gear and turn it over to install the torsion spring.

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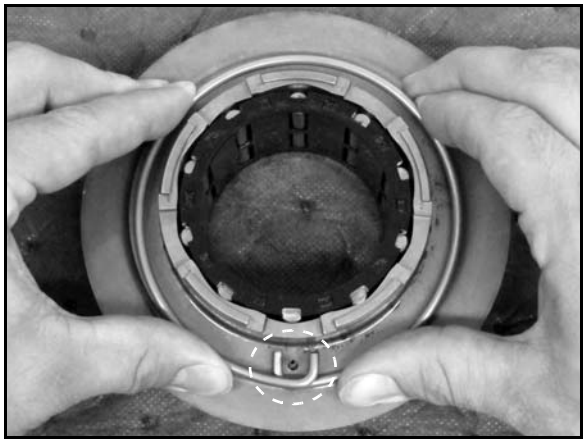
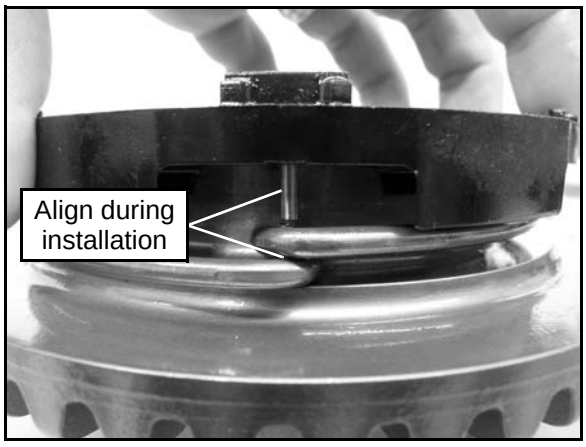
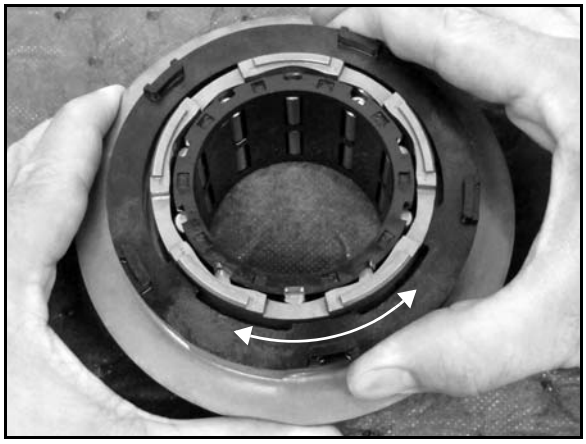
10. Install the torsion spring by wrapping each leg of the spring around the dowel pin on the ring gear.



11. Align the spring retainer dowel pin with the ring gear dowel pin and install the retainer on top of the torsion spring.

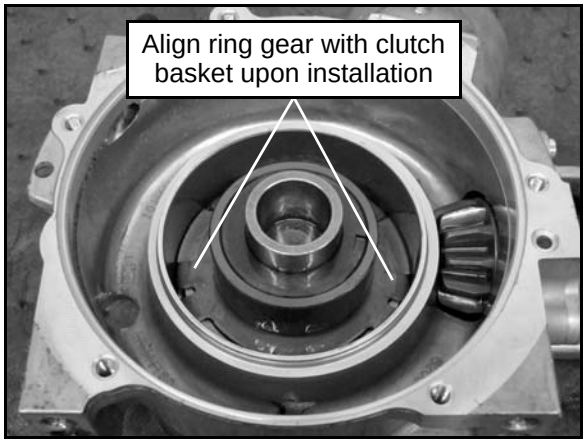


12. Check the action of the torsion spring by rotating in both directions to ensure the spring and retainer are installed properly.

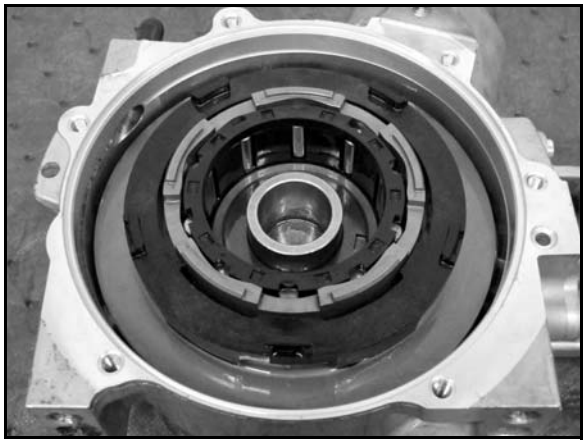


13. Install the male (RH) output hub assembly into the main gearcase.

IMPORTANT: Take care not to damage the seal lip or seal spring while installing the output hub.

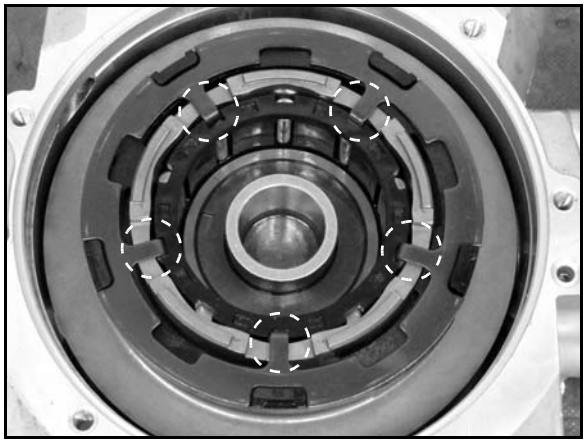


14. Carefully install the ring gear and roll cage assembly into the gearcase housing.



NOTE: Rotate ring gear to align the grooves with the output hub clutch basket during installation.

15. Install the armature plate on top of the roll cage / ring gear assembly. Be sure that the armature plate tabs are fully engaged into the roll cage assembly and are resting on the cut-out grooves of the ring gear.



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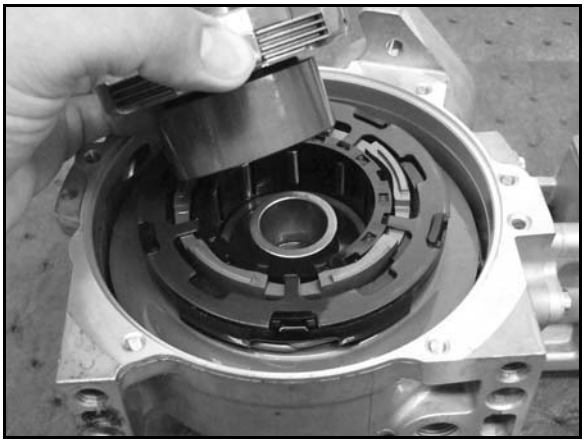
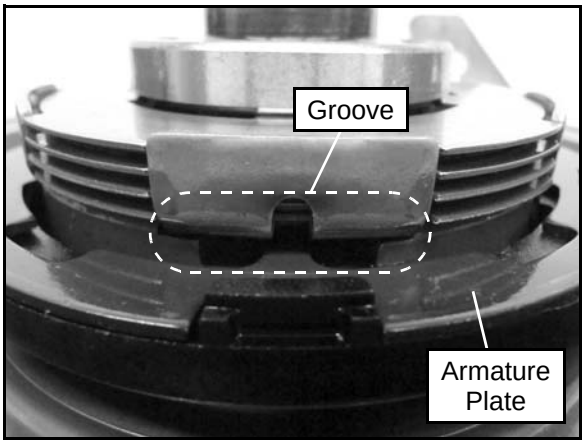
16. Install the female (LH) output hub assembly into the roll cage / ring gear assembly.

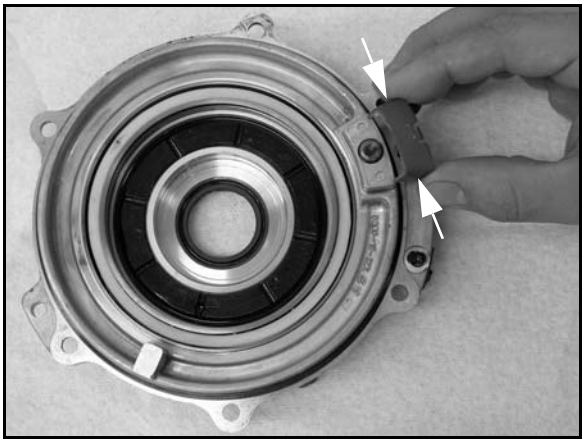


NOTE: Rotate output hub to align the clutch basket with the grooves in the ring gear during installation.



17. Install the large O-ring onto the cover plate and small O-ring onto the main gearcase.

18. Lightly crimp the thrust pad to hold the pad on the cover plate during installation.



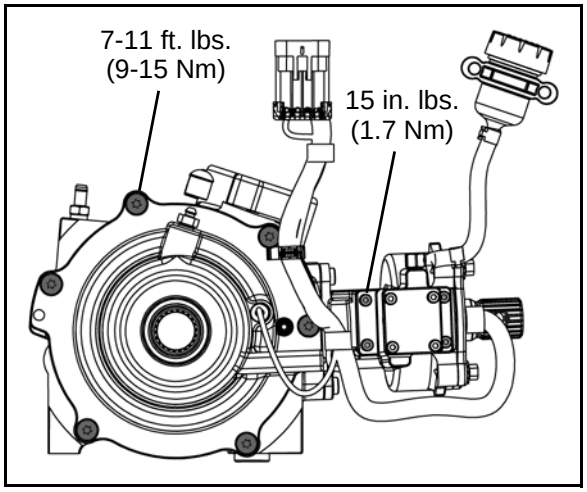
19. Place the cover plate assembly on the main gearcase and install the (6) screws. Torque screws to specification.

IMPORTANT: Take care not to damage the seal lip or seal spring while installing the cover plate.

= T
Cover Plate Screws: **7-11 ft. lbs. (9-15 Nm)**

20. Install the piston pump assembly with new O-rings. Torque the screws to specification.

= T
Pump Assembly Screws: **15 in. lbs. (1.7 Nm)**



IMPORTANT: If the cover plate was replaced or if the backlash set screw was repositioned, proceed to the "Setting Ring Gear Backlash" procedure.

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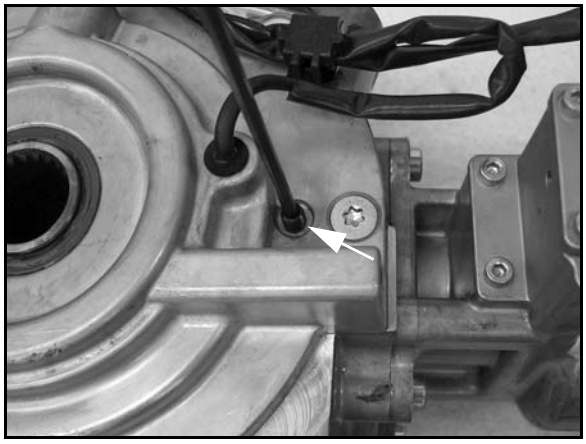
Setting Ring Gear Backlash

NOTE: Ring gear backlash is set at the factory. No adjustment is required, unless the front cover is replaced or the backlash screw has been tampered with.

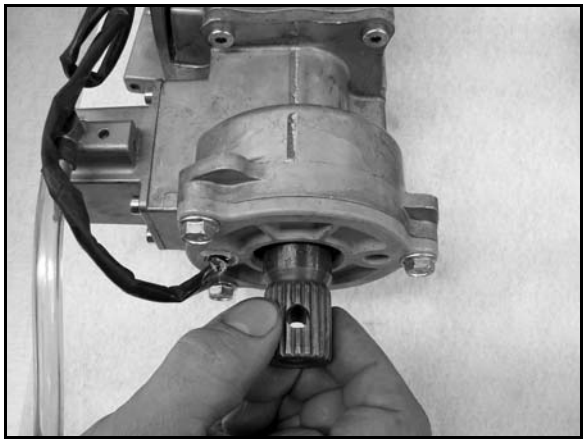
1. The backlash screw has locking agent that holds it into place. Use a heat gun to lightly heat up the locking agent on the screw.

2. Using an Allen wrench, turn the backlash screw out 3-4 turns. Re-apply Loctite 262™ onto the bottom screw threads.



3. Turn the screw in until it is lightly seated, then turn the screw out 1/4 turn.

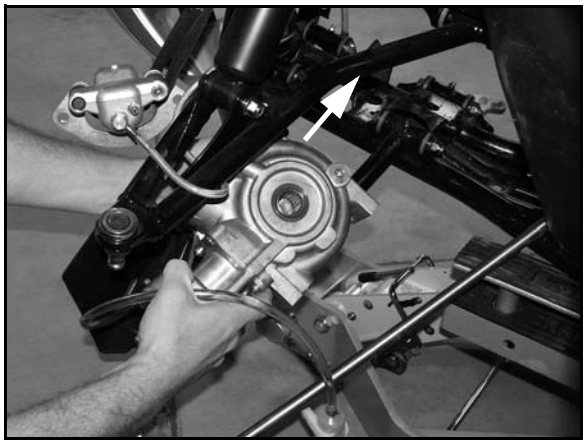
4. Set the gearcase upright. Rotate input shaft at least 4 times. This ensures the ring gear completes one full rotation.



5. If a tight spot is felt during rotation, loosen the backlash screw another 1/8 turn and perform step 4 again. Repeat this procedure until the pinion shaft rotates smoothly 4 times (1 revolution of ring gear).

Gearcase Installation (Non-EPS Models)

1. Install the gearcase between the A-arms as shown.



2. Route the ADC reservoir and clear hose up through the center of the chassis. Do not allow hose to become pinched.

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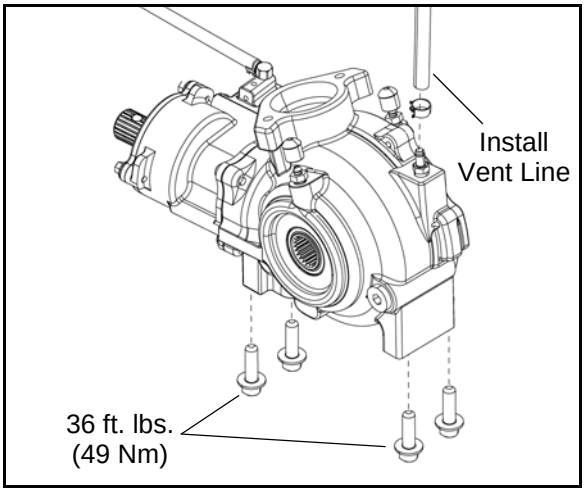
3. Mount the reservoir to the frame using the previously removed screw.
4. Install the vent line and the (4) bolts that secure the front gearcase to frame. Torque bolts to specification.



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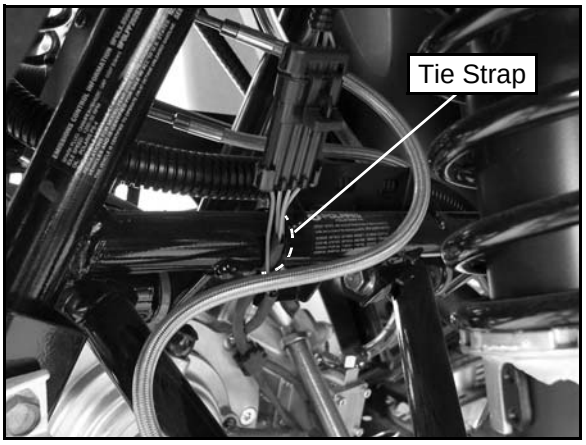
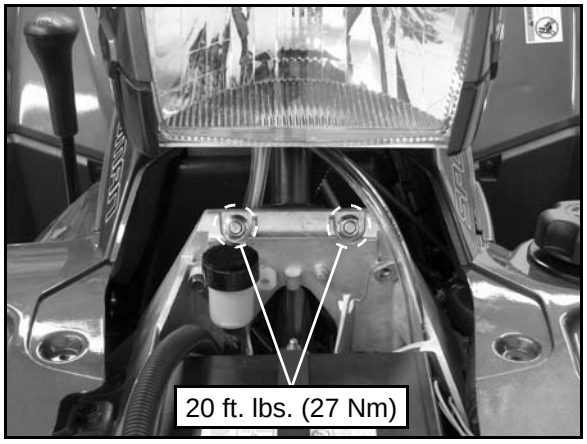
Front Gearcase Mounting Bolts:
36 ft. lbs. (49 Nm)

5. Connect and route the AWD wire harness along the frame and install a plastic tie strap to attach it to the frame.



6. Place the steering post and bearing into the front gearcase.
7. Reinstall the upper steering post bushing bracket and torque the (2) fasteners to specification.



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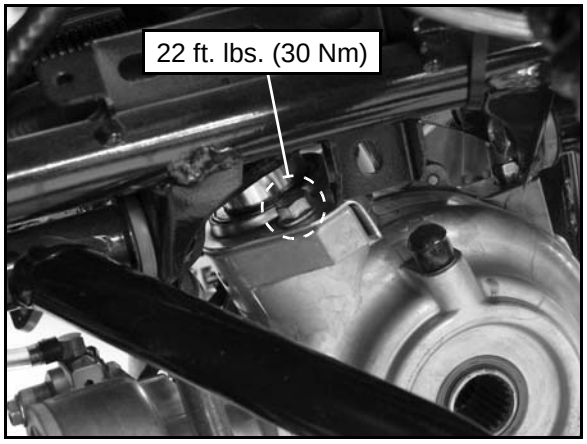
Steering Post to Bulkhead Bolts:
20 ft. lbs. (27 Nm)

8. Install the (2) bolts securing the lower portion of the steering post to the gearcase and torque to specification.



= T

Steering Post to Gearcase Bolts:
22 ft. lbs. (30 Nm)

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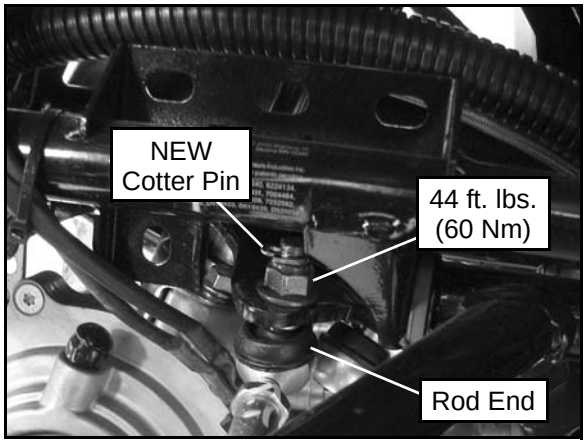
9. Install the steering tie rod ends into the steering frog. Torque the tie rod end fasteners to specification and install new cotter pins.



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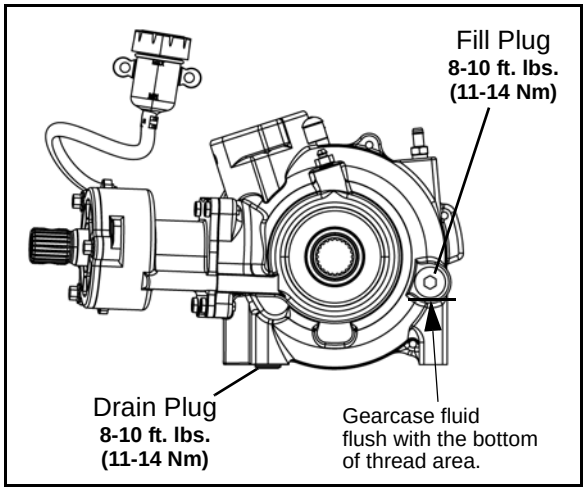
Tie Rod to Steering Frog:
44 ft. lbs. (60 Nm)

10. Install the front cover and front rack (see Chapter 9).
11. Install the front propshaft onto the front gearcase input shaft (see "FRONT PROPSHAFT - Installation").
12. Install both front drive shafts into the front gearcase (see "FRONT DRIVE SHAFT - Installation").
13. Reinstall the front gearcase drain plug with a new O-ring and torque to specification.
14. Add the recommended amount of fluid. Maintain fluid level even with the bottom threads of the fill plug hole.



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Recommended Front Gearcase Fluid:
Polaris Demand Drive Plus
(PN 2877922) (Quart)

Capacity: 9.3 oz. (275 ml)

15. Reinstall fill plug with a new O-ring and torque to specification.

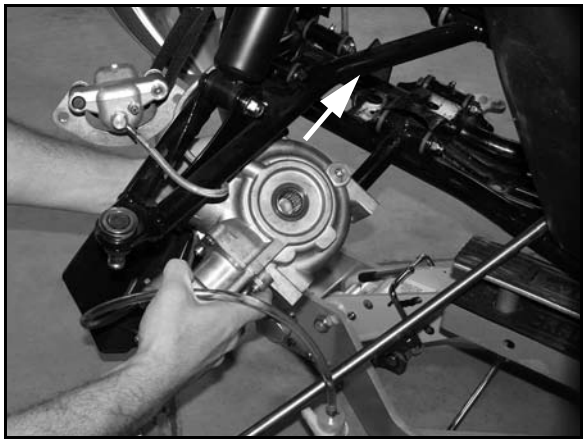
= T

Drain / Fill Plug Torque:
8-10 ft. lbs. (11-14 Nm)

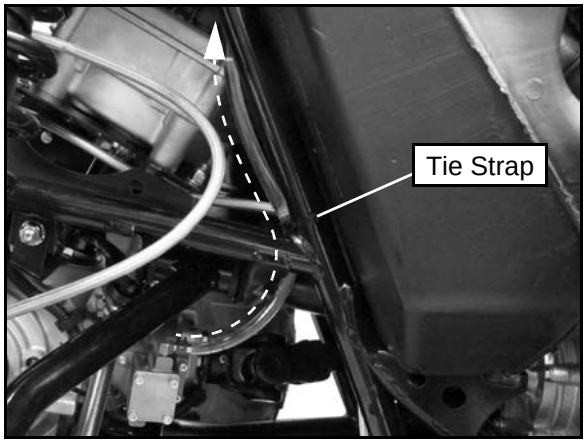
16. Check for external leaks. If the ADC system was serviced, it must be bled (see "ADC System Fluid Bleeding").

Gearcase Installation (EPS Models)

1. Install the gearcase between the A-arms as shown.



2. Route the ADC reservoir and clear hose up through the center of the chassis. Do not allow hose to become pinched.



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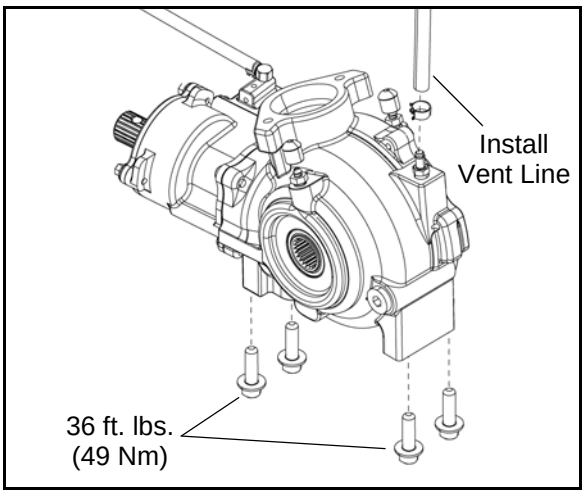
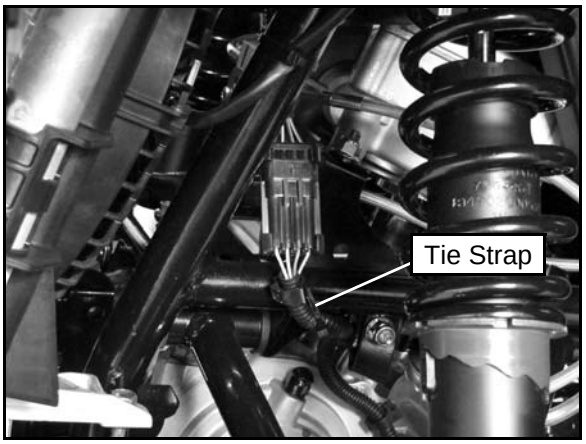
3. Mount the reservoir to the frame using the previously removed screw.

4. Install the vent line and the (4) bolts that secure the front gearcase to frame. Torque bolts to specification.



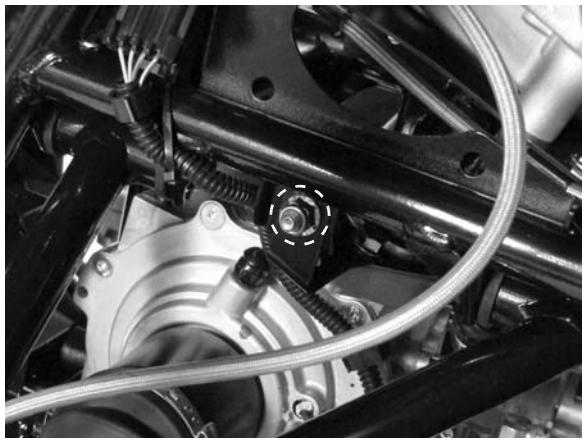
= T
Front Gearcase Mounting Bolts: **36 ft. lbs. (49 Nm)**

5. Connect and route the AWD wire harness along the frame and install a plastic tie strap to attach it to the frame.

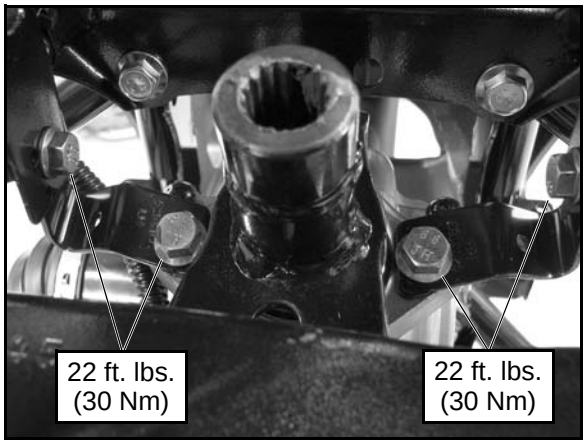


6. Place the lower steering post assembly onto the front gearcase.

7. Install the LH and RH front gearcase brackets and the (2) bolts that retain them. Finger tighten only until the lower steering post assembly is installed.



8. Install the (2) bolts securing the lower steering post assembly to the gearcase and torque all (4) bolts to specification.



= T
Front Gearcase Bracket Bolts: **22 ft. lbs. (30 Nm)** Lower Steering Post to Gearcase Bolts: **22 ft. lbs. (30 Nm)**

9. Reinstall the power steering unit, attach the upper steering post and install the fuel tank. Refer to Chapter 10 “Power Steering Unit Installation”.

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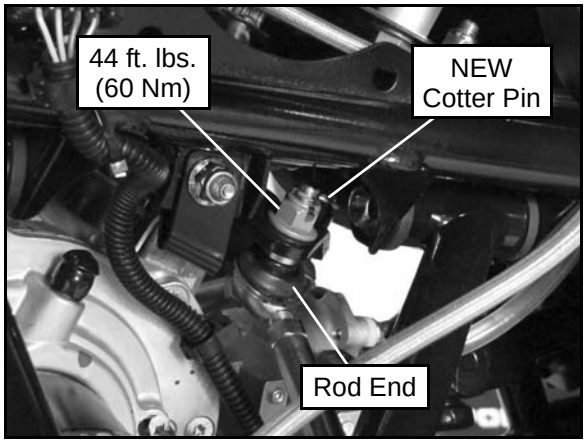
10. Install the steering tie rod ends into the steering frog. Torque the tie rod end fasteners to specification and install new cotter pins.



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Tie Rod to Steering Frog:
44 ft. lbs. (60 Nm)

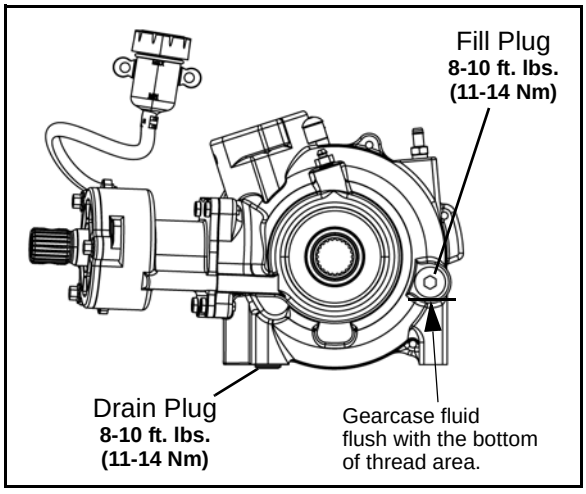
11. Install the front cover and front rack (see Chapter 9).

12. Install the front propshaft onto the front gearcase input shaft (see "FRONT PROPSHAFT - Installation").

13. Install both front drive shafts into the front gearcase (see "FRONT DRIVE SHAFT - Installation").

14. Reinstall the front gearcase drain plug with a new O-ring and torque to specification.

15. Add the recommended amount of fluid. Maintain fluid level even with the bottom threads of the fill plug hole.



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Recommended Front Gearcase Fluid:
Polaris Demand Drive Plus
(PN 2877922) (Quart)

Capacity: 9.3 oz. (275 ml)

16. Reinstall fill plug with a new O-ring and torque to specification.

= T

Drain / Fill Plug Torque:
8-10 ft. lbs. (11-14 Nm)

17. Check for external leaks. If the ADC system was serviced, it must be bled (see "ADC System Fluid Bleeding").

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ADC System Fluid Bleeding

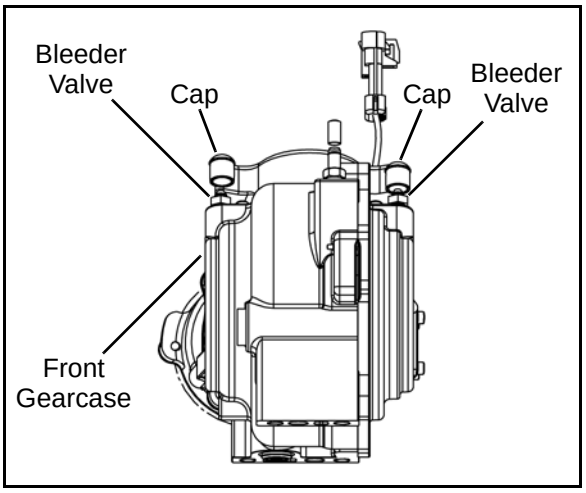
1. Position the vehicle on a level surface and allow the vehicle to sit for at least 30 minutes.
2. Thoroughly clean the areas around the ADC reservoir and bleeder valves.
3. Remove the reservoir cap and diaphragm assembly.
4. Make sure the fluid inside the reservoir is free of debris. If any debris is found, use a clean shop towel or suction device to remove it from the reservoir.

NOTE: Debris in the reservoir may result in inadequate bleeding and reduced performance of the system.

5. Begin the bleeding process by filling reservoir to the "MAX" level with clean Polaris Demand Drive Plus.

=
Recommended ADC Fluid: Polaris Demand Drive Plus (PN 2877922) (Quart)

6. Locate bleeder valves found on each side of the front gearcase and remove the protective caps.



7. Attach a clean clear hose to one of the bleeder valves.
8. Slowly loosen the valve (counter-clockwise) and allow fluid and trapped air to flow from the fitting.

IMPORTANT: Do not allow ADC fluid in reservoir to drop below the "MIN" fill line. Close bleeder valve before the fluid level drops below the "MIN" fill line. Refilling an empty reservoir will result in air pockets becoming trapped.

9. Close the valve when clean (bubble-free) fluid begins to flow from the valve.
10. Repeat steps 7-9 on the remaining bleeder valve.
11. Torque the bleeder valves to specification and reinstall the protective caps.

= T
Bleeder Valve Torque: **80 in. lbs. (9 Nm)**

12. Fill reservoir to a level midway between "MAX" and "MIN" fill lines. Verify no debris is found in reservoir fluid.
13. Install the reservoir cap and diaphragm securely and wipe clean any fluid residue.

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REAR BEARING CARRIER

Inspection / Removal

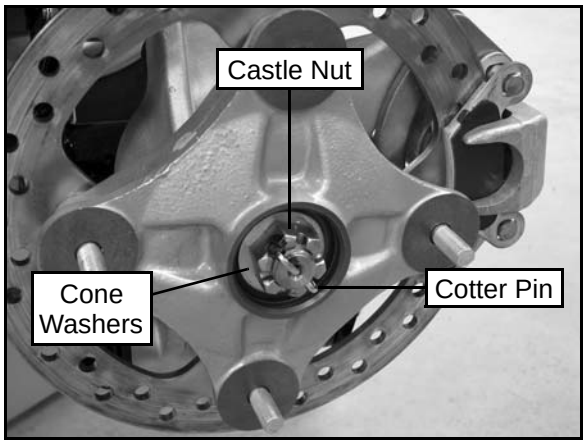
1. Elevate rear of vehicle and safely support machine under the frame area.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

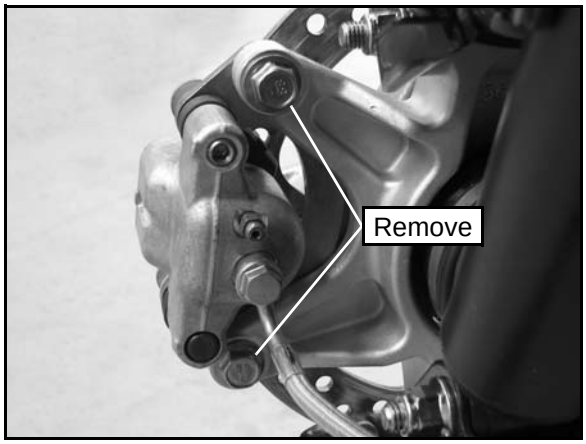
2. Check bearings for side play by grasping the top and bottom of the tire firmly and checking for movement. The tire should rotate smoothly without binding or rough spots.

3. Remove the (4) wheel nuts and remove the rear wheel.

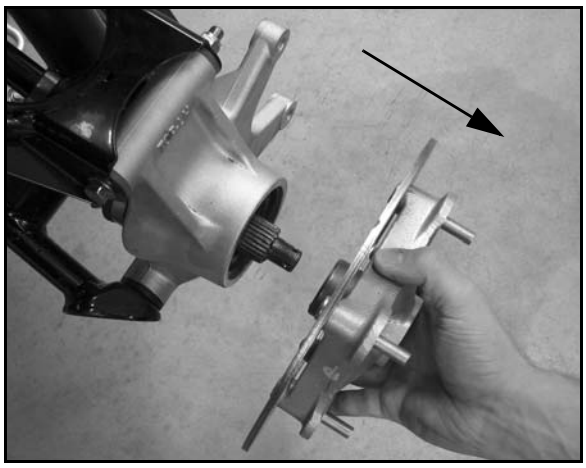
4. Remove the cotter pin and loosen the rear wheel hub castle nut. Remove the nut, and (2) cone washers from the rear wheel hub assembly.



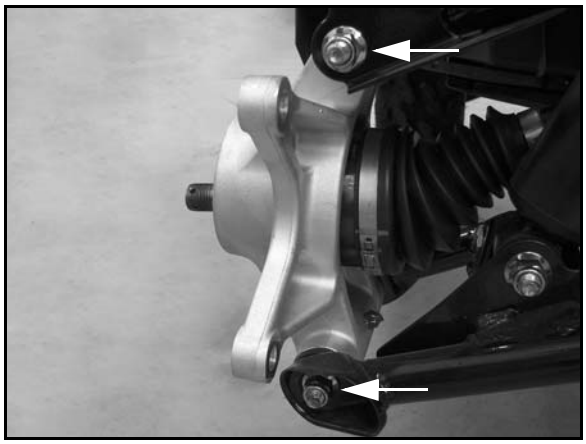
5. Remove the two brake caliper mounting bolts.
CAUTION: Do not hang the caliper by the brake line. Use wire to hang caliper to prevent damage to the brake line.



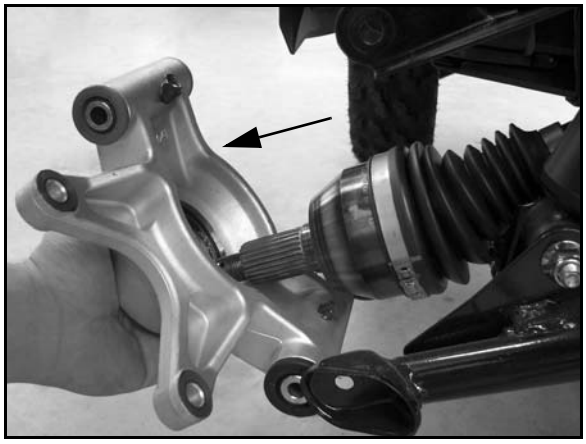
6. Remove the rear wheel hub assembly.



7. Remove the bolts that attach the rear bearing carrier to the upper and lower A-arms.



8. Remove the bearing carrier from the rear drive shaft.



9. Rotate bearing by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion.

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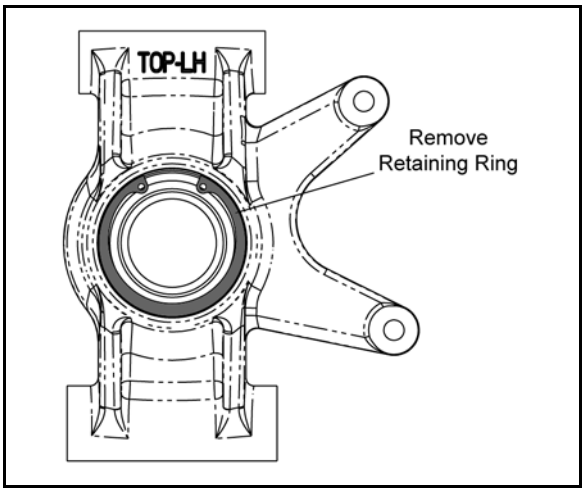
NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement sideways between inner and outer race.

10. Replace bearing if moisture, dirt, corrosion, or roughness is evident.

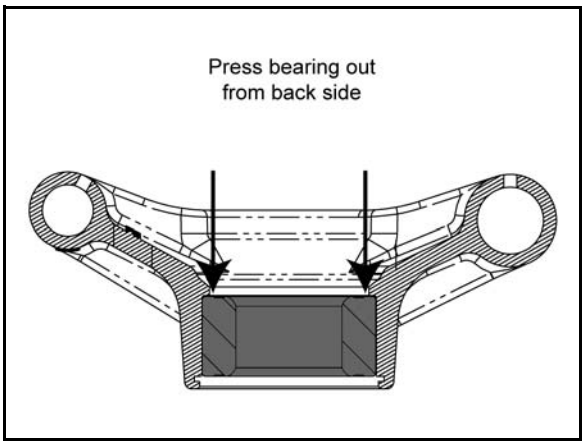
Bearing Replacement

Bearing Removal

1. Remove the outer retaining ring from the bearing carrier.



2. Support the bearing carrier in an arbor press and remove the bearing by pressing it out from the back side.



3. Inspect the bearing carrier housing for scratches, wear or damage. Replace rear bearing carrier if damaged.

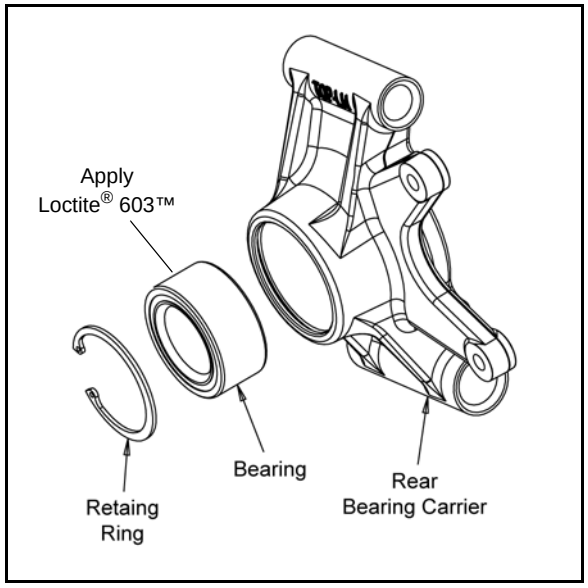
Bearing Installation

4. Thoroughly clean the rear bearing carrier housing and the outer race on the new bearing. Be sure that all oil residue has been removed from each surface.

5. Support the bottom of the bearing carrier housing.

> **⚠ CAUTION**
>
> Use an arbor and press only on the outer race or bearing damage may occur.

6. Apply **Loctite® 603™** retaining compound to the outer circumference of the new bearing race and carefully press the new bearing into the bearing carrier housing.



NOTE: Use care to not allow any of the Loctite® compound to get in the bearing.

7. Wipe the housing clean of any excess compound and install the snap ring.

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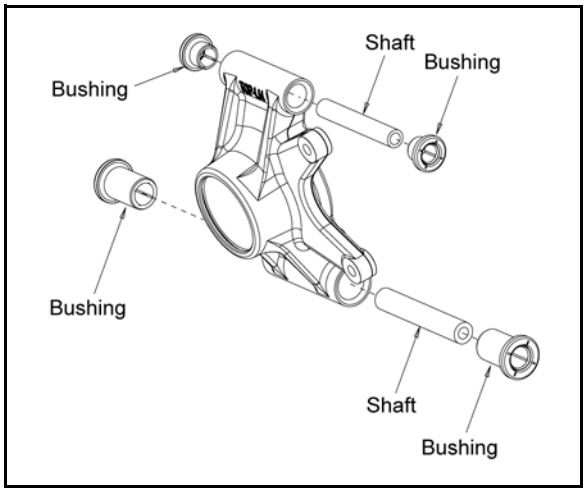
Bushing Replacement

1. Check bearing carrier bushings and shafts for excessive wear or damage.

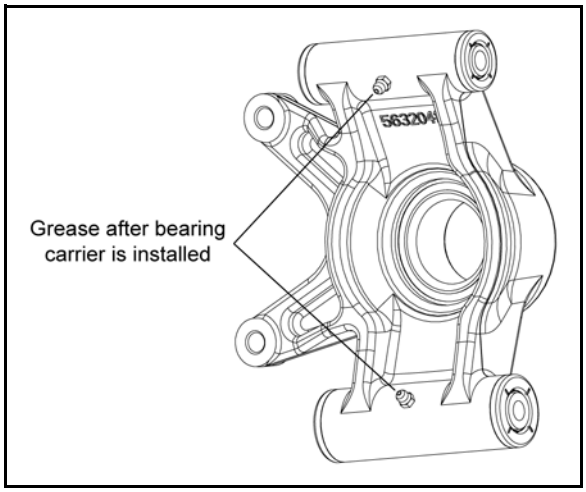
2. If replacement is required, slide shafts out and remove the bushings with a drift punch.



3. Thoroughly clean the bearing carrier and inspect for excessive wear or damage. Replace rear bearing carrier if damaged.

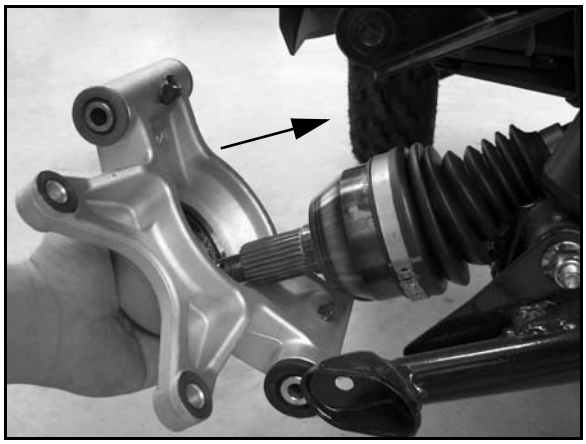
4. Install new shafts and bushings. Press the bushings into the bearing carrier until they are flush with the mating surface.

5. Grease the rear bearing carrier fittings after it has been installed and the rear A-arms have been attached.

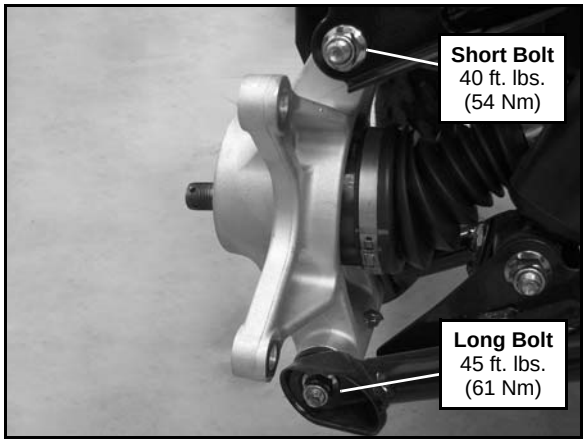


Installation

1. Install drive shaft axle through the backside of the bearing carrier. Be sure bushings and pivot tubes are installed.



2. Install the fasteners that attach the rear bearing carrier to the upper and lower A-arms. Torque bolts to specification.



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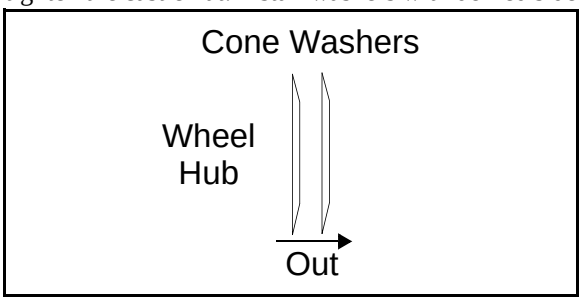
Rear Bearing Carrier Bolts:
Upper: 40 ft. lbs. (54 Nm)
Lower: 45 ft. (61 Nm)

3. Apply grease to drive shaft axle splines.

4. Install rear wheel hub assembly, cone washers, and hand tighten the castle nut. Install washers with domed side out.



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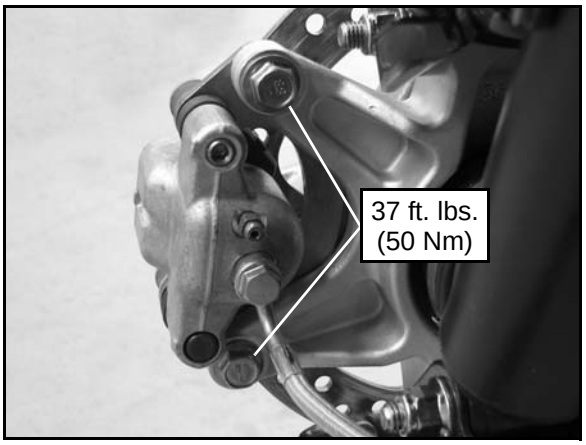
5. Install the brake caliper and torque the new mounting bolts to specification.

⚠ CAUTION

New bolts have a pre-applied locking agent which is destroyed upon removal. Always use new brake caliper mounting bolts upon assembly.



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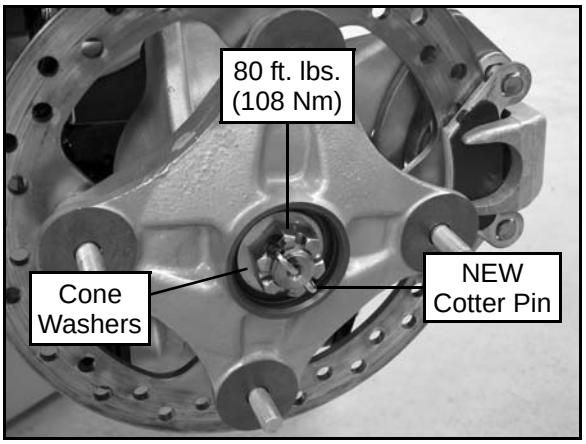
Rear Caliper Mounting Bolts:
37 ft. lbs. (50 Nm)

6. Torque wheel hub nut to specification and install a new cotter pin. Tighten nut slightly if necessary to align cotter pin holes.



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Wheel Hub Castle Nut:
80 ft. lbs. (108 Nm)

7. Install the rear wheel and (4) wheel nuts. Torque wheel nuts to specification.

= T

Wheel Nuts:
Steel Wheels: 45 ft. lbs. (61 Nm)
Aluminum Wheels: 75 ft. lbs. (102 Nm)

8. Rotate wheel and check for smooth operation. Bend both ends of cotter pin around end of spindle in different directions.

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REAR DRIVE SHAFT

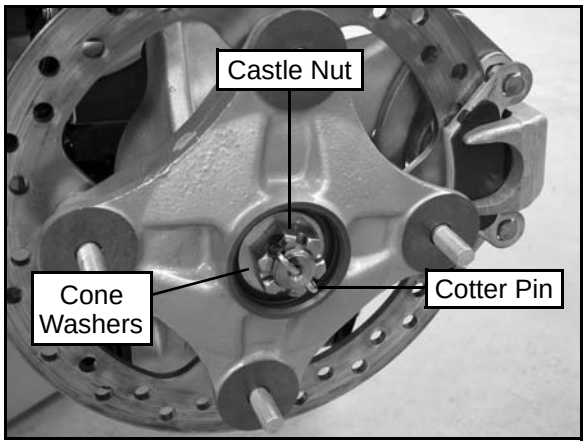
Removal

1. Elevate rear of vehicle and safely support machine under the frame area.

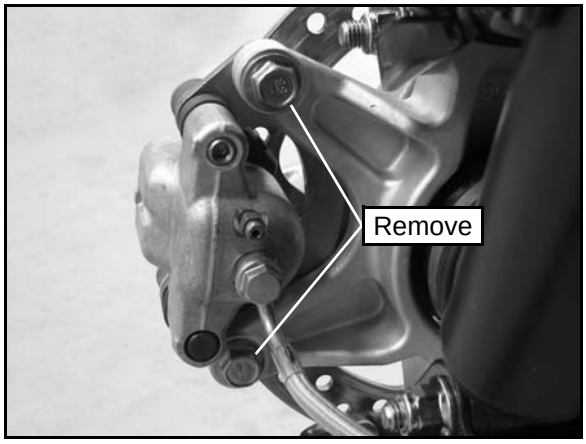
> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

2. Remove the (4) wheel nuts and remove the rear wheel.

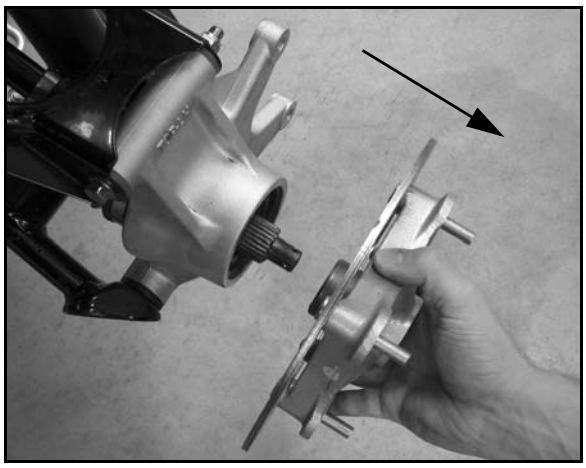
3. Remove the cotter pin and loosen the rear wheel hub castle nut. Remove the nut, and (2) cone washers from the rear wheel hub assembly.



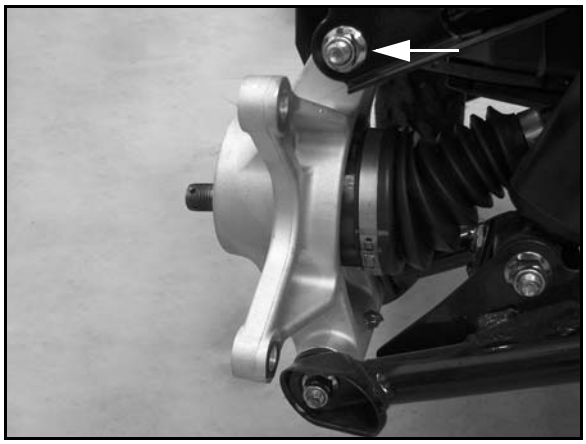
4. Remove the two brake caliper mounting bolts.
CAUTION: Do not hang the caliper by the brake line. Use wire to hang caliper to prevent damage to the brake line.



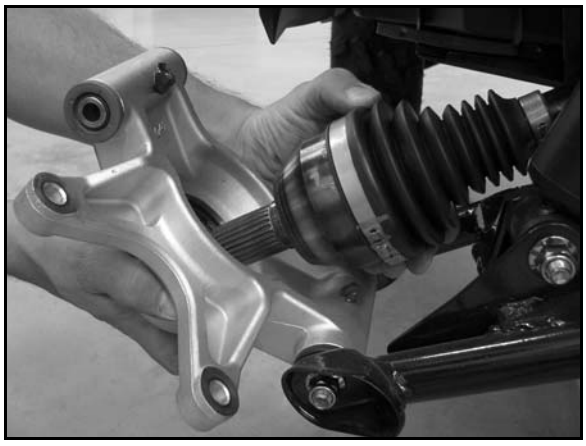
5. Remove the rear wheel hub assembly.



6. Remove the bolt that attaches the upper A-arm to the rear bearing carrier.



7. Tilt the top portion of the bearing carrier down and pull the rear drive shaft out from the bearing carrier.



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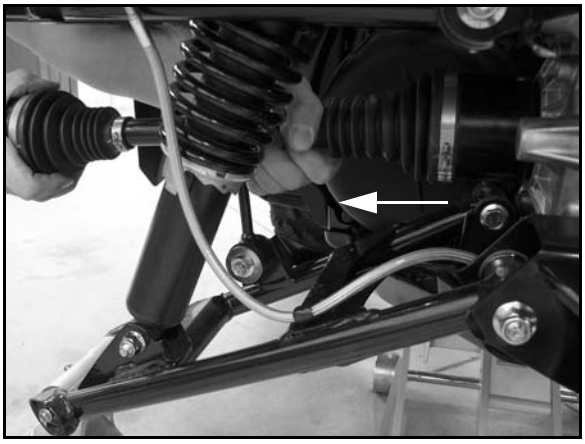
8. Grasp the rear drive shaft and pull sharply outward on the shaft to disengage it from the rear gearcase.

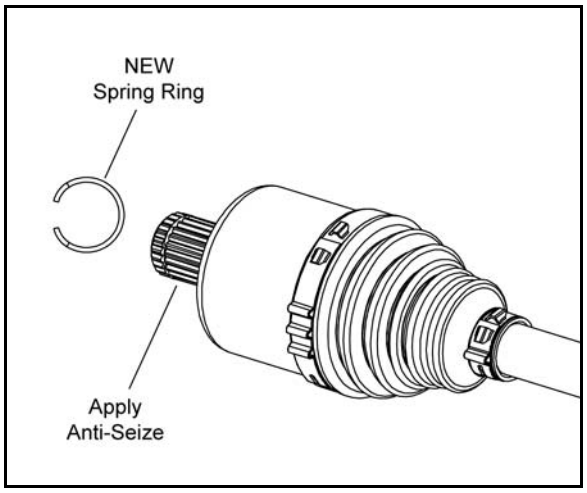


9. Inspect the axle splines and CV boots for any damage.

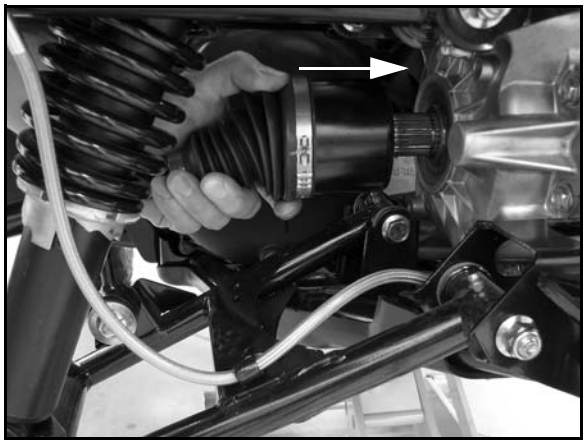
10. Refer to the “DRIVE SHAFT SERVICE” procedure if repairing the drive shaft.

Installation

1. Install a new spring ring on the end of the drive shaft and apply an anti-seize compound to the splines.



2. Align the splines of the drive shaft with the rear gearcase and reinstall the drive shaft. Use a rubber mallet to tap on the outboard end of the drive shaft if necessary.



3. Install the drive shaft into the rear bearing carrier.

4. Refer to the “REAR BEARING CARRIER - Installation” procedure within this chapter to properly reassemble the vehicle.

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DRIVE SHAFT SERVICE

Drive Shaft / CV Joint Handling Tips

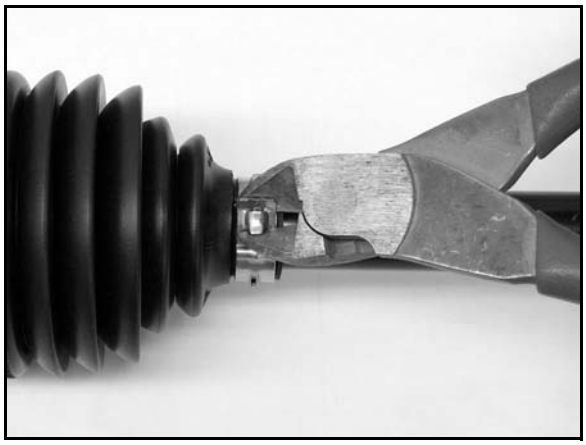
Care should be exercised during drive shaft removal or when servicing CV joints. Drive shaft components are precision parts.

Cleanliness and following these instructions is very important to ensure proper shaft function and a normal service life.

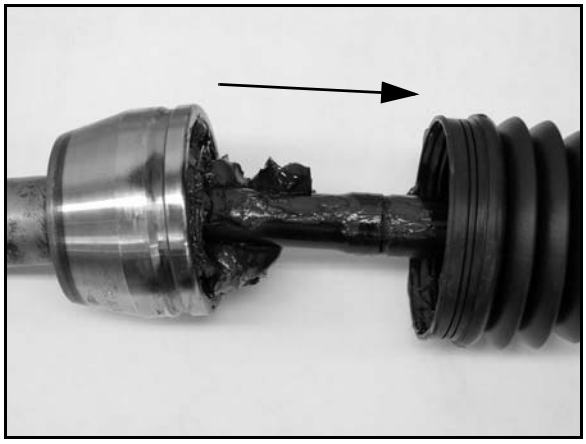
- The complete drive shaft and joint should be handled by getting hold of the interconnecting shaft to avoid disassembly or potential damage to the drive shaft joints.
- Over-angling of joints beyond their capacity could result in boot or joint damage.
- Make sure surface-ground areas and splines of shaft are protected during handling to avoid damage.
- Do not allow boots to come into contact with sharp edges or hot engine and exhaust components.
- The drive shaft is not to be used as a lever arm to position other suspension components.
- Never use a hammer or sharp tools to remove or to install boot clamps.
- Be sure joints are thoroughly clean and that the proper amount and type of grease is used to refill when joint boots are replaced and when joints are cleaned. Refer to text for grease capacity of CV joints and CV joint boots.

Outer CV Joint / Boot Replacement

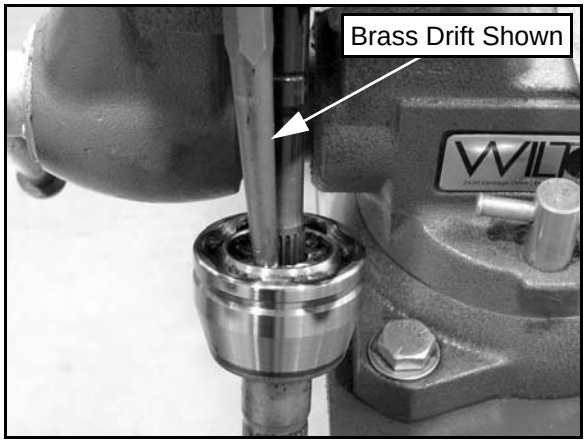
1. Using a side cutters, cut away and discard the boot clamps.



2. Remove the large end of the boot from the CV joint and slide the boot down the shaft.

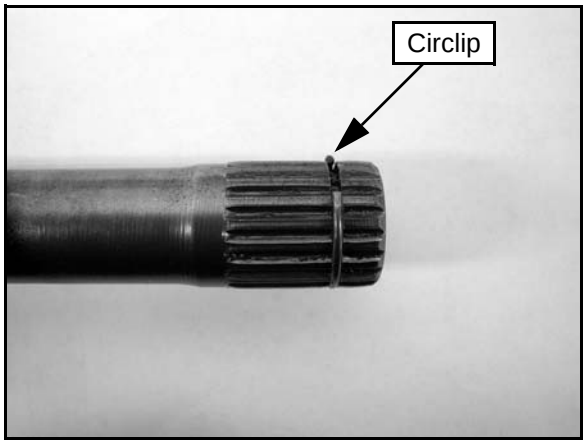


3. Clean the grease from the face of the joint.
4. Place the drive shaft in a soft-jawed vise.
5. Using a soft-faced hammer, or brass drift, strike the inner race of the joint to drive the joint off the drive shaft. Be sure to tap evenly around the joint to avoid binding.



IMPORTANT: Tap on inner race only!

6. Make sure the circlip is on the shaft and not left in the joint.



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7. Remove the CV boot from the shaft.

> **⚠ CAUTION**
>
> Complete disassembly of the CV joint is NOT recommended. The internal components are a precision fit and develop their own characteristic wear patterns. Intermixing the internal components could result in looseness, binding, and/or premature failure of the joint.

IMPORTANT: If the grease in the joint is obviously contaminated with water and/or dirt, the joint should be replaced.

8. Thoroughly clean the joint with an appropriate solvent and dry the joint to prevent any residual solvent from being left in the joint upon reassembly.

9. Visually inspect the joint by tilting the inner race to one side to expose each ball. Severe pitting, galling, play between the ball and its cage window, any cracking or damage to the cage, pitting or galling or chips in raceways call for joint replacement.

NOTE: Shiny areas in ball tracks and on the cage spheres are normal. Do not replace CV joints because parts have polished surfaces. Replace CV joint only if components are cracked, broken, worn or otherwise unserviceable.

10. Clean the splines on the end of the shaft and apply a light coat of grease prior to reassembly.

11. Slide the small boot clamp and boot (small end first) onto the drive shaft and position the boot in it's groove machined in the shaft.

12. Install a NEW circlip on the end of the shaft.

13. Grease the joint with the special CV joint grease provided in the boot replacement kit. Fill the cavity behind the balls and the splined hole in the joint's inner race. Pack the ball tracks and outer face flush with grease. Place any remaining grease into the boot.

> **⚠ CAUTION**
>
> The grease provided in the replacement kit is specially formulated for wear resistance and durability. DO NOT use substitutes or mix with other lubricants.

NOTE: The amount of grease that's provided is pre-measured, so use all the grease.

Boot Replacement Grease Requirements:

Grease Only Service Kits
PN 1350059 - 20g / PN 1350046 - 30g / PN 1350047 - 50g

Outer CV Joint Capacity:
Front - 80g / Rear - 90g

14. Slide the joint onto the drive shaft splines and align the circlip with the lead-in chamfer on the inner race of the joint.

15. Use a soft-faced hammer to tap the joint onto the drive shaft until it locks into place.

16. Pull on the joint to make sure it is securely locked in place.

17. Remove excess grease from the CV joint's external surfaces and place the excess grease in the boot.

18. Pull the boot over the joint and position the boot lips into the grooves on the joint housing and shaft. Make sure the boot is not dimpled or collapsed.

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19. Install and tighten the large clamp using the appropriate clamp tool.

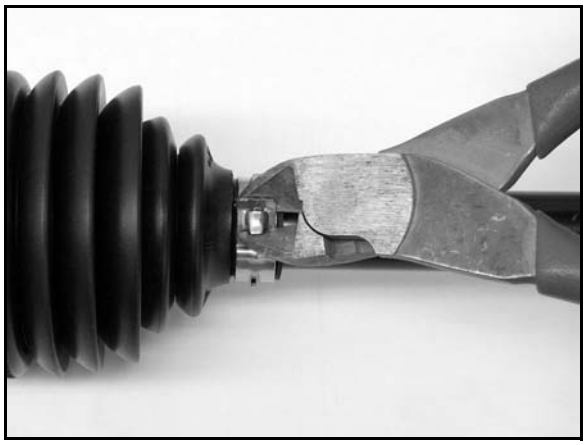
Axle Boot Clamp Tool: PU-48951
or
CV Boot Clamp Pliers: 8700226

20. While pulling out on the CV shaft, fully extend the CV joint and slide a straight O-ring pick or a small slotted screw driver between the small end of the boot and the shaft. This will allow the air pressure to equalize in the CV boot in the position that the joint will spend most of its life. Before you remove your instrument, be sure the small end of the boot is in its correct location on the shaft.

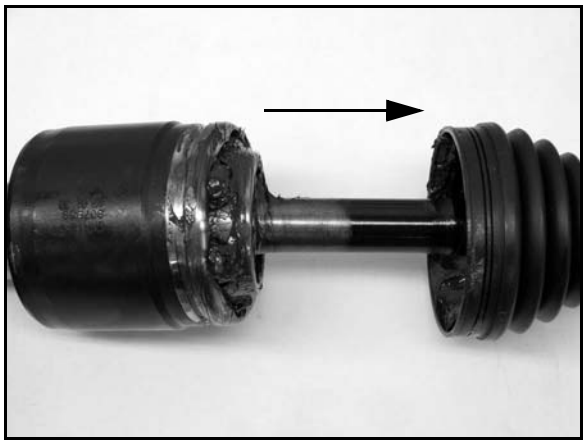
21. Install and tighten the small clamp on the boot using the appropriate clamp tool.

Inner Plunging Joint / Boot Replacement

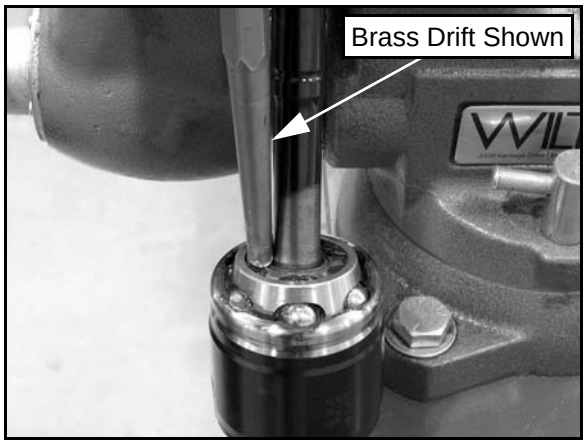
1. Using a side cutters, cut away and discard the boot clamps.



2. Remove the large end of the boot from the plunging joint and slide the boot down the shaft.



3. Clean the grease from the face of the joint.
4. Place the drive shaft in a soft-jawed vise.
5. Using a soft-faced hammer, or brass drift, strike the inner race of the joint to drive the joint off the drive shaft. Be sure to tap evenly around the joint to avoid binding.



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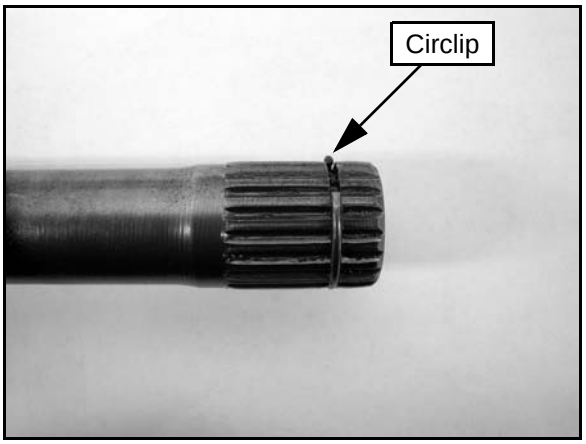
IMPORTANT: Tap on inner race only!

6. Make sure the circlip is still on the shaft and not left in the joint.



7. Remove the boot from the shaft.

> **CAUTION**
>
> Complete disassembly of the plunging joint is NOT recommended. The internal components are a precision fit and develop their own characteristic wear patterns. Intermixing the internal components could result in looseness, binding, and/or premature failure of the joint.

IMPORTANT: If the grease in the joint is obviously contaminated with water and/or dirt, the joint should be replaced.

8. Thoroughly clean the joint with an appropriate solvent and dry the joint to prevent any residual solvent from being left in the joint upon reassembly.

9. Visually inspect the joint for damage. Replace if needed.

10. Clean the splines on the end of the shaft and apply a light coat of grease prior to reassembly.

11. Slide the small boot clamp and boot (small end first) onto the drive shaft and position the boot in its groove machined in the shaft.

12. Install a NEW circlip on the end of the shaft.

13. Grease the joint with the special CV joint grease provided in the boot replacement kit. Fill the cavity behind the balls and the splined hole in the joint's inner race. Pack the ball tracks and outer face flush with grease. Place any remaining grease into the boot.

> **CAUTION**
>
> The grease provided in the replacement kit is specially formulated for wear resistance and durability. DO NOT use substitutes or mix with other lubricants.

NOTE: The amount of grease that's provided is pre-measured, so use all the grease.

Boot Replacement Grease Requirements:

Grease Only Service Kits

PN 1350059 - 20g / PN 1350046 - 30g / PN 1350047 - 50g

Inner Plunging Joint Capacity:
Front - 60g / Rear - 90g

14. Fully compress the joint and push the drive shaft firmly into the inner race.

15. Align the circlip with the lead-in chamfer.

16. Use a soft-faced hammer to tap the joint onto the drive shaft until you reach the end of the splines and the joint locks in place.

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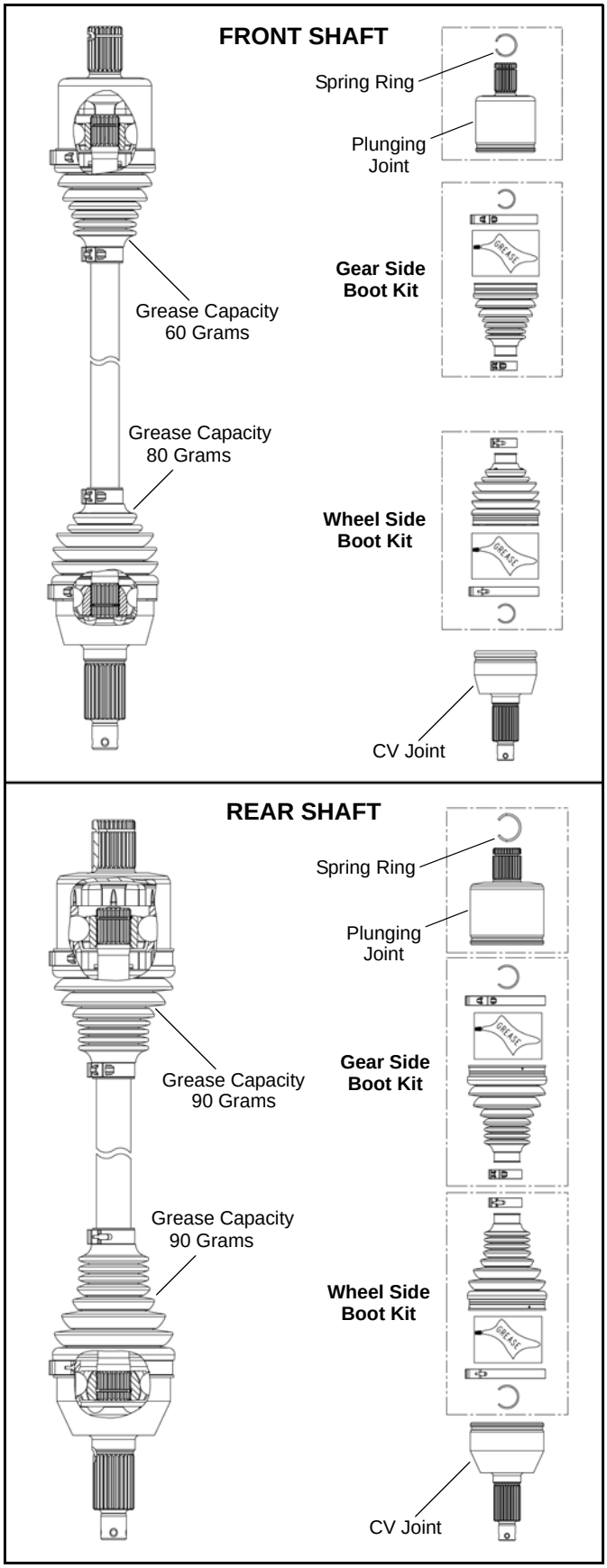
17. Pull on the joint to test that the circlip is seated and that the joint is securely fastened to the shaft.
18. Remove excess grease from the plunging joint's external surfaces and place the excess grease in the boot.
19. Pull the boot over the joint and position the boot lips into the grooves on the joint housing and shaft. Make sure the boot is not dimpled or collapsed.
20. Install and tighten the small clamp using the appropriate clamp tool.

Axle Boot Clamp Tool: PU-48951
or
CV Boot Clamp Pliers: 8700226

21. Pull out on the drive shaft to center the joint in the housing. Slide a straight O-ring pick or a small slotted screw driver between the large end of the boot and the joint housing and lift up to equalize the air pressure in the boot.
22. Position the boot lip in its groove. Install and tighten the large clamp using the appropriate clamp tool.

Drive Shaft Exploded View



8

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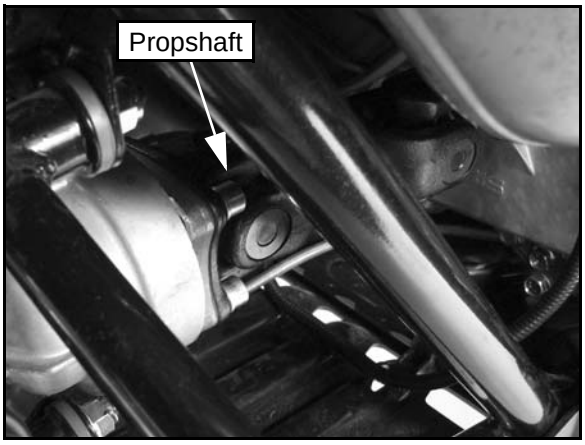
REAR PROPSHAFT

Removal

1. Locate the rear propshaft through the right rear wheel well.



NOTE: If needed, remove the right rear wheel to gain better access to the rear propshaft bolts.

2. Remove the (4) bolts retaining the rear propshaft to the rear gearcase input shaft coupler and discard the bolts.

3. Slide the shaft towards the transmission and pivot the propshaft down. Slide the propshaft off the transmission output shaft and out from the vehicle.

Installation

1. Apply anti-seize compound to all splines. Slide propshaft back onto the transmission output shaft, and then lift it up and align it with the rear gearcase input shaft coupler.
2. Install (4) **new** bolts and torque to specification.

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Rear Propshaft Bolts: **18 ft. lbs. (24 Nm)**

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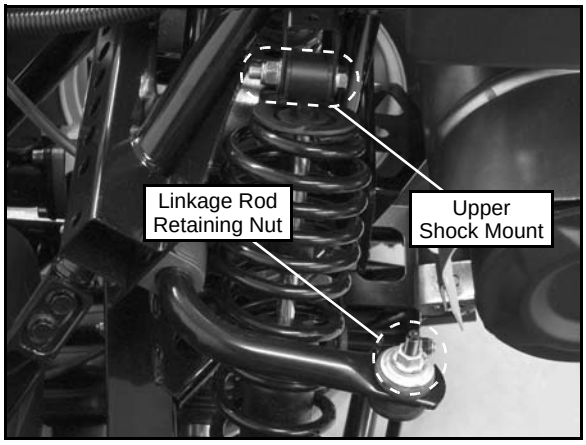
REAR GEARCASE

Gearcase Removal (XP Models)

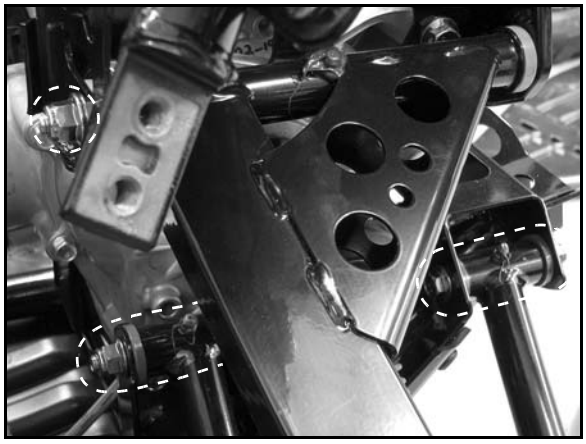
1. Position the vehicle on a level surface and remove the seat.
2. Drain the rear gearcase lubricant (see Chapter 2).
3. Remove the rear cab (see Chapter 9).
4. Remove the left rear wheel, lower left-hand frame support and outer PVT cover. Refer to Chapter 7 “DRIVE BELT - Belt Removal (XP Models)”.
5. Remove the (4) bolts retaining the rear propshaft to the rear gearcase input shaft.

6. Slide the shaft towards the transmission and pivot the propshaft down. Slide the propshaft off the transmission output shaft and out from the vehicle.
7. Remove the drive belt, drive clutch and driven clutch. Refer to Chapter 7 “PVT SYSTEM SERVICE - PVT Disassembly (XP Models)”.
8. Remove the top retaining nut from each stabilizer bar linkage rod and rotate the stabilizer bar out of the way.

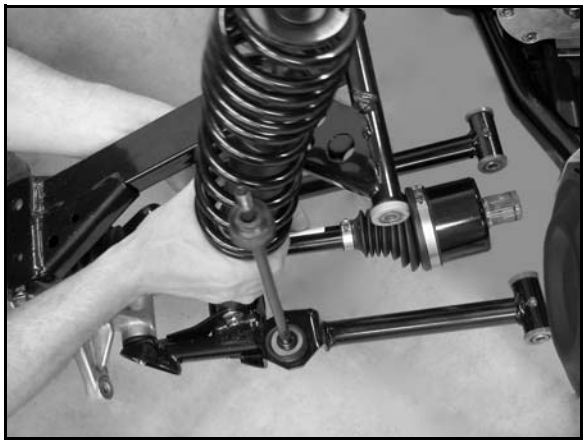
NOTE: Hold the linkage rod with a 5/16” open-end wrench to prevent the rod from turning.



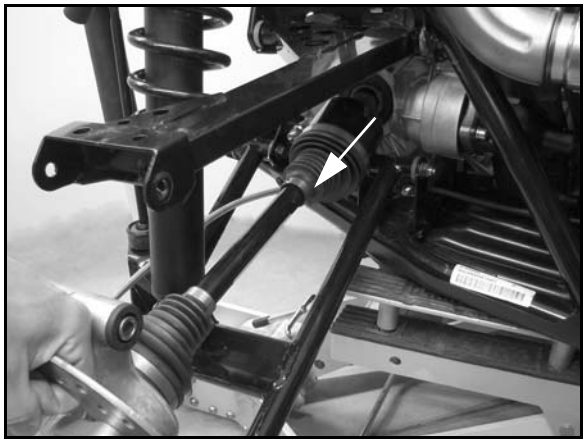
9. Remove the upper shock mounting bolts from each side.
10. Remove the (3) through-bolt fasteners retaining the left rear upper and lower A-arms to the frame.



11. Remove the left rear suspension and drive shaft from the vehicle as an assembly.



12. Remove the through-bolt fastener retaining the right rear upper A-arm to the bearing carrier. Pivot the wheel hub and bearing carrier down to remove the drive shaft from the gearcase.



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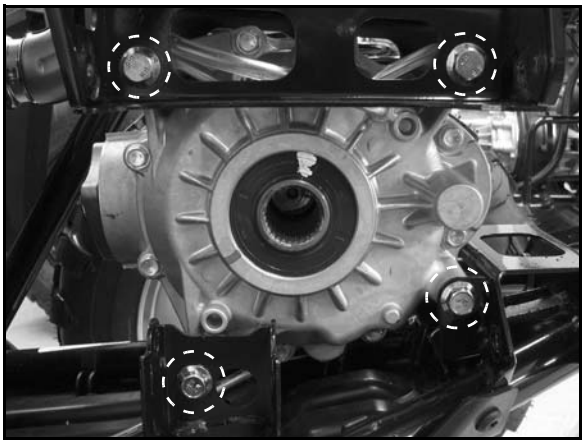
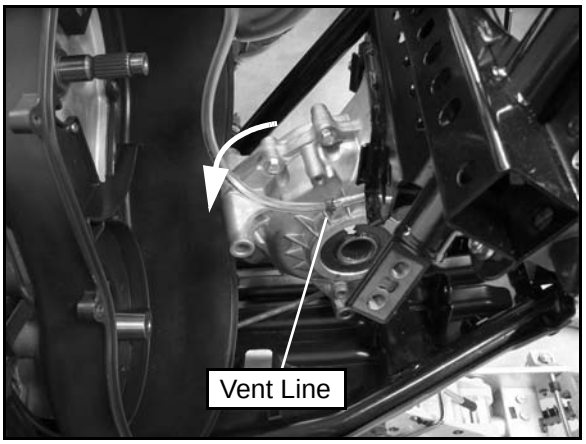
IMPORTANT: Take care not to stretch the brake line while removing the drive shaft.

13. Remove the drive shaft from the rear gearcase by pulling sharply.
14. Remove the (4) through-bolts retaining the rear gearcase to the frame.

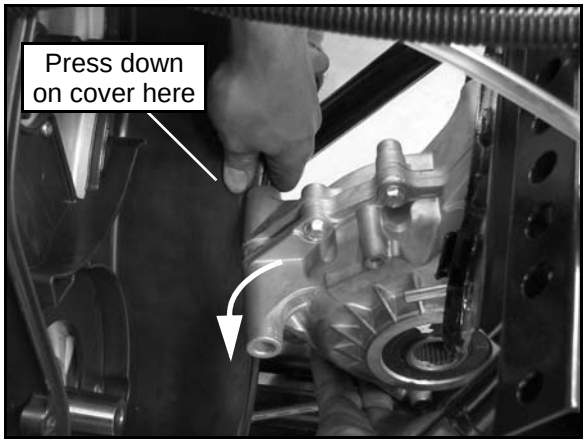


15. Lift up on the gearcase and move it forward in the frame.

16. Begin to rotate the gearcase down and remove the vent line.

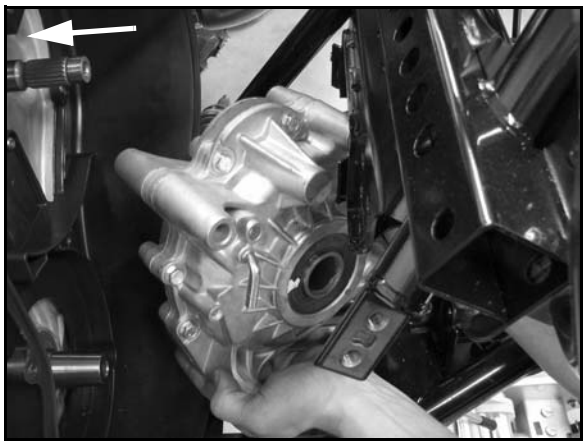


17. Using your hand, press down on the inner PVT cover and continue to rotate the gearcase down and forward until it is removed from the frame.



IMPORTANT: Do not use a pry bar to flex the inner PVT cover as damage to the cover will occur.

18. Rotate the gearcase so the input shaft is facing down and remove the rear gearcase from the vehicle.



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Gearcase Removal (TOURING Models)

1. Position the vehicle on a level surface, remove the passenger seat and driver's seat.

2. Remove the (6) T40 Torx-headed screws retaining the rear skid plate and remove the skid plate from the frame.

3. Drain the rear gearcase lubricant (see Chapter 2).

4. Elevate rear of vehicle and safely support machine under the frame area.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

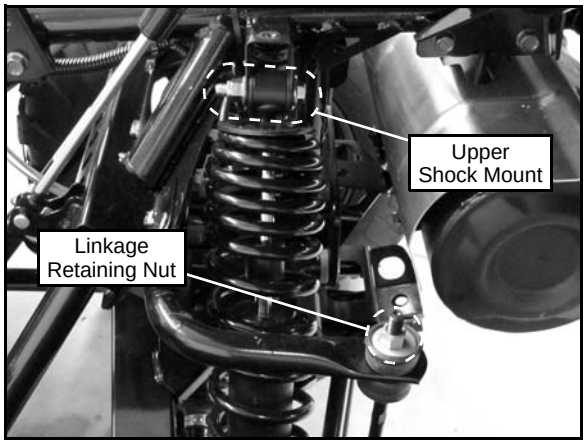
5. Remove the (4) wheel nuts retaining each wheel and remove both rear wheels.

6. Remove the (4) bolts retaining the rear propshaft.

7. Slide the shaft towards the transmission and pivot the propshaft down. Slide the propshaft off the transmission output shaft and out from the vehicle.

8. Remove the top retaining nut from each stabilizer bar linkage and rotate the stabilizer bar back out of the way.

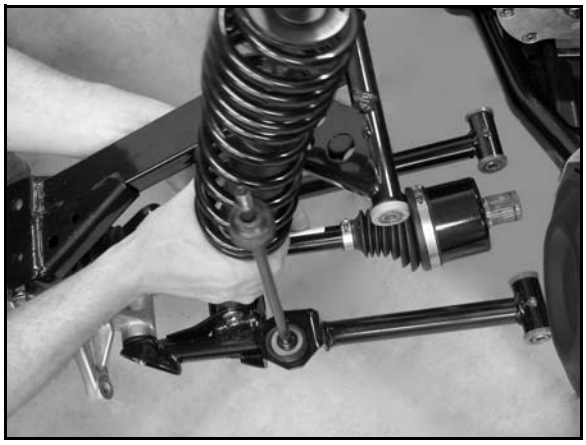
NOTE: Hold the linkage rod with a 5/16" open-end wrench to prevent the rod from turning.



9. Remove the upper shock mounting bolts from each side.

10. Remove the (3) through-bolt fasteners retaining the left rear upper and lower A-arms to the frame.

11. Remove the left rear suspension and drive shaft from the vehicle as an assembly.



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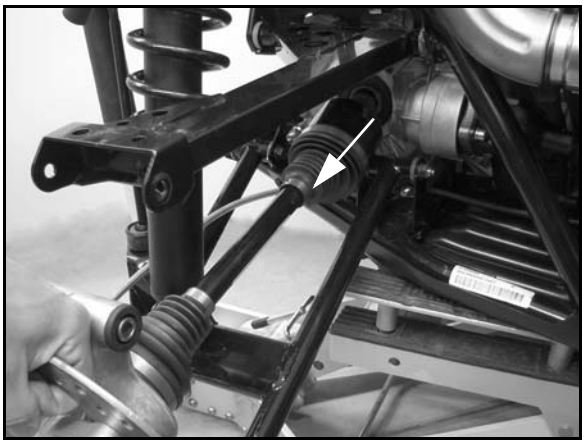
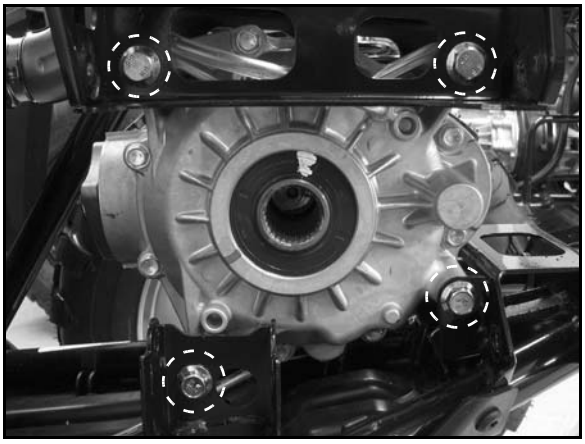
12. Remove the through-bolt fastener retaining the right rear upper A-arm to the bearing carrier. Pivot the wheel hub and bearing carrier down to remove the drive shaft from the gearcase.



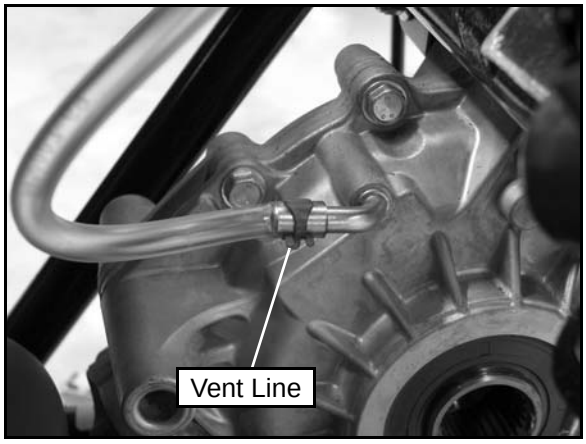
IMPORTANT: Take care not to stretch the brake line while removing the drive shaft.

13. Remove the drive shaft from the rear gearcase by pulling sharply.

14. Remove the (4) through-bolts retaining the rear gearcase to the frame.



15. Move the gearcase forward in the frame and remove the vent line from the gearcase.



16. Using care, remove the rear gearcase through the bottom of the frame.

NOTE: Be sure to move the rear brake line out of the way upon removal to prevent from damaging it.

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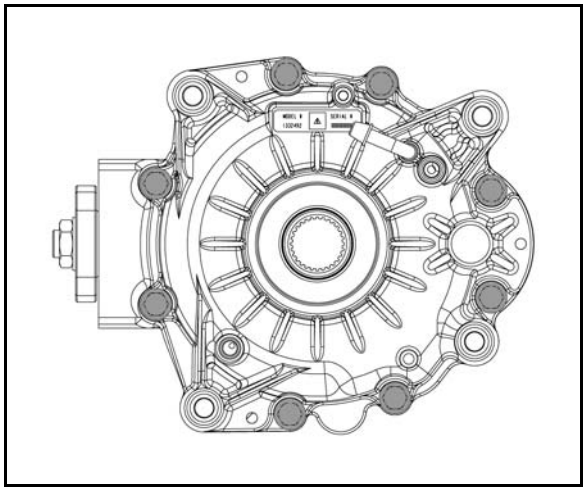
Gearcase Disassembly and Inspection

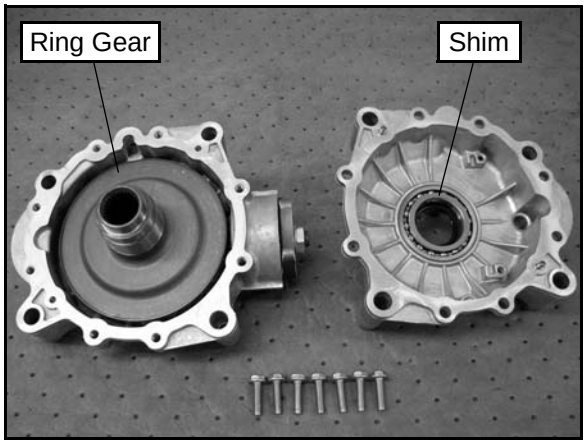
IMPORTANT: Pinion and ring gear shimming information is NOT provided. The components are matched at the factory, which requires special OEM tooling in order to properly assemble and shim the gears.

In the event damage to the gears or housing requires replacement, the entire assembly must be replaced.

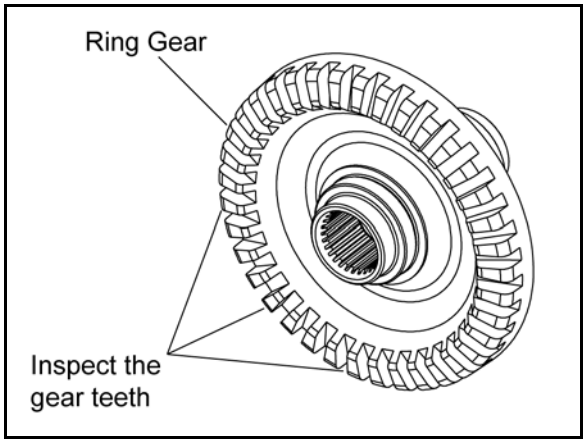
1. Drain and properly dispose of used gearcase lubricant.
2. Remove the (8) screws from the rear gearcase cover.



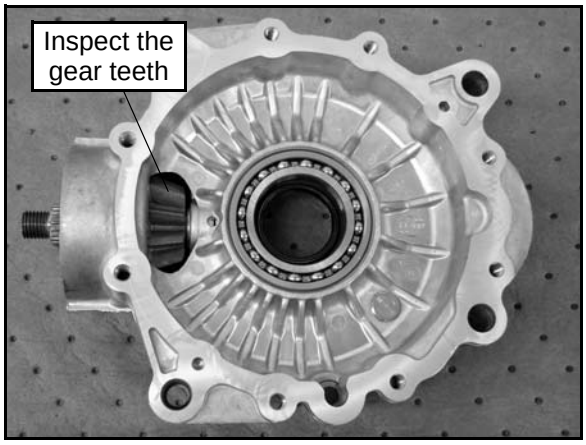
3. Lift the gearcase cover off the main gearcase half and note the shim between the cover and the ring gear.
4. Remove the ring gear from the main gearcase half.



5. Inspect the ring gear teeth for chipped, worn, or broken teeth.



6. Inspect the pinion shaft by rotating the assembly in the gearcase housing while checking for any looseness or roughness. Inspect the pinion gear teeth for chipped, worn, or broken teeth.



NOTE: In the event damage to the gears or housing requires replacement, the entire assembly must be replaced.

7. Inspect the gearcase bearings and seals. Proceed to "Gearcase Bearing and Seal Replacement" if components require service.

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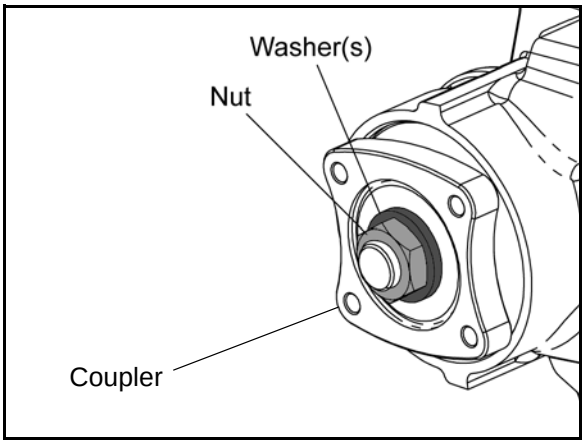
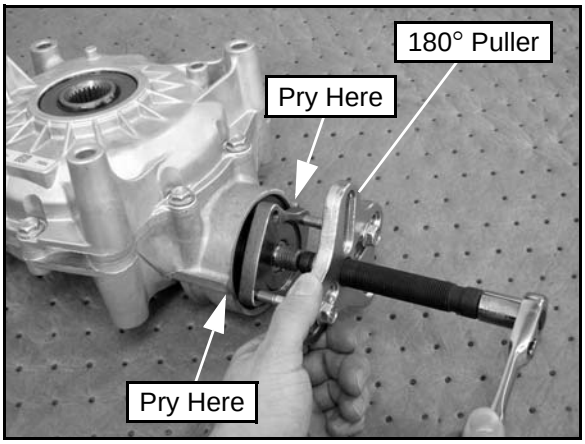
Gearcase Bearing and Seal Replacement

NOTE: If the gearcase is assembled, perform the "Gearcase Disassembly and Inspection" procedure.

1. Remove the nut and lock washer from the pinion shaft (if necessary, hold the coupler in a vise to remove the nut).



2. Remove the coupler from the pinion shaft by using two pry bars in the areas shown. If the coupler is difficult to remove, use a universal bolt-grip puller to prevent any damage.



3. Remove the seal above the pinion shaft using a seal puller or other suitable method (see Figure 8-27).

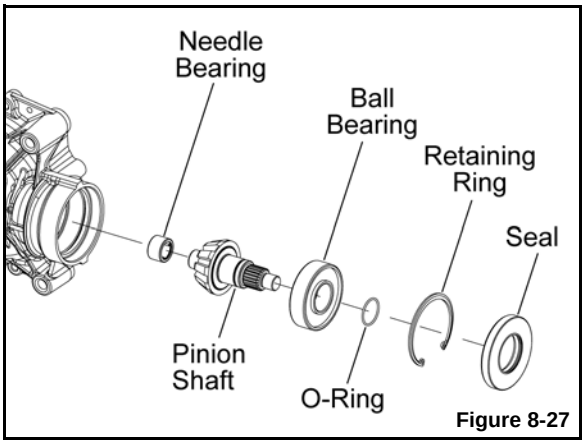


Figure 8-27

4. Remove the retaining ring and lift the pinion shaft and bearing from the main gearcase (see Figure 8-27).

NOTE: If the pinion shaft will not lift out of the gearcase, reinstall the coupler and finger tighten the retaining nut. Use two pry bars to lift the pinion shaft assembly out.

5. Support the pinion shaft and press the bearing off the shaft (see Figure 8-27).
6. Thoroughly clean the pinion shaft.

> **⚠ WARNING**
>
> Wear appropriate safety equipment while installing bearings to reduce the risk of injury.

7. Support the pinion shaft and carefully press the new bearing on the shaft and install a new O-ring (see Figure 8-27).

IMPORTANT: Carefully inspect the pinion shaft gear before replacing the bearing. If the gear teeth are damaged, the shaft must be replaced as an assembly.

8. Remove the seals from each case half using a seal puller or other suitable method (see Figure 8-28).

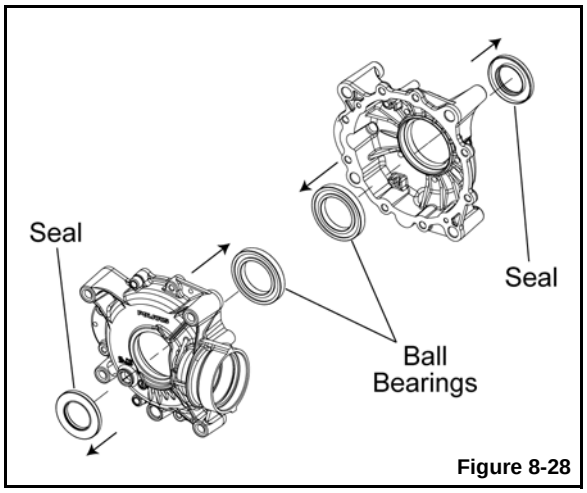


Figure 8-28

9. Support the gearcase cover and press the bearing out. Repeat this procedure on the main gearcase half, unless the bearing came out with the ring gear (see Figure 8-28).

NOTE: If the main gearcase bearing is installed on the ring gear, heat the bearing to remove it.

10. Thoroughly clean the gearcase halves.

> **⚠ WARNING**
>
> Wear appropriate safety equipment while installing bearings to reduce the risk of injury.

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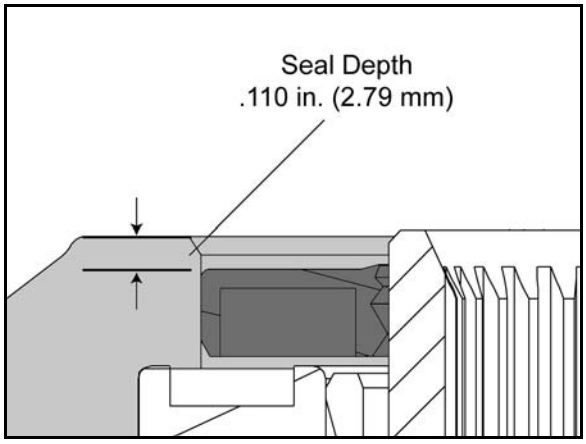
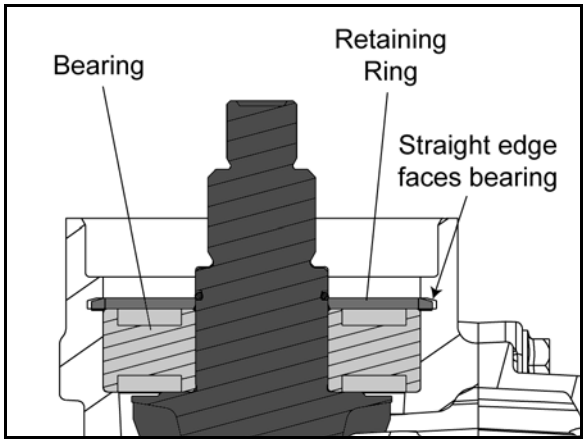
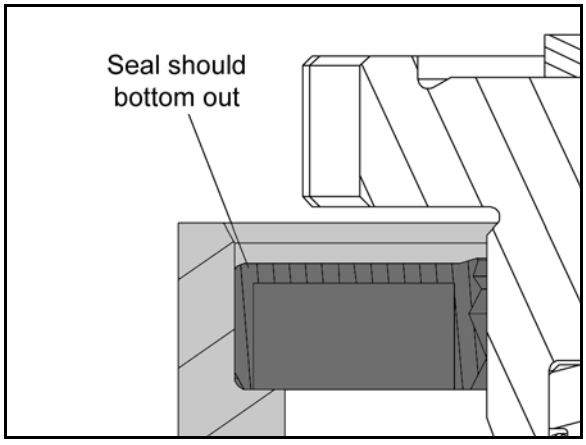
11. Support the gearcase cover and carefully press in the new cover bearing (see Figure 8-28). Support the ring gear and carefully press on the new main gearcase bearing.
12. Install the seals into the case halves using a standard seal installer or other suitable method. Seal depth should be approximately .110 in. (2.79 mm) from the main surface.



13. Install the pinion shaft and a new retaining ring. Install the retaining ring with the straight edge facing the bearing.

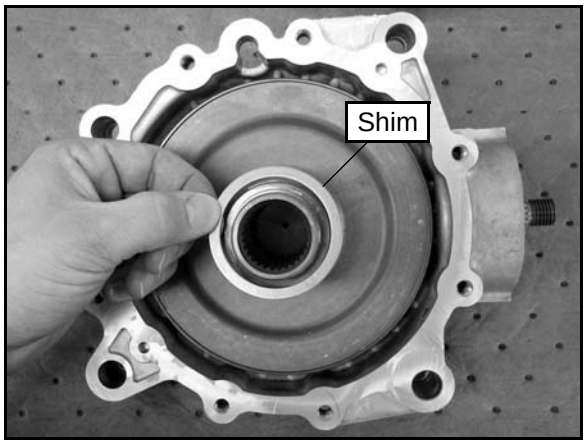


14. Install the seal into the main gearcase half using a standard seal installer or other suitable method. Press seal into the gearcase until it bottoms out in the housing.

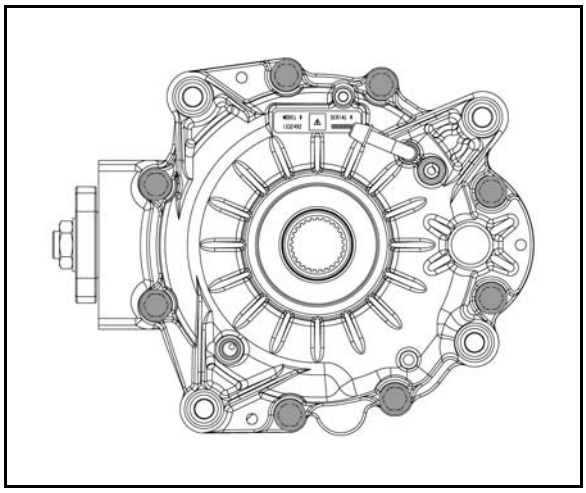


Gearcase Assembly

1. Grease all seals with **Polaris All Season Grease (PN 2871322)** upon assembly to prevent from damaging seals.
2. Install the ring gear into the main gearcase.
3. Install the shim previously removed onto the ring gear.



4. Thoroughly clean the gearcase mating surfaces and be sure the alignment pins are in place.
5. Apply Crankcase Sealant (PN 2871557) to mating surfaces.
6. Install the gearcase cover onto the main gearcase half.
7. Install the cover screws and torque to specification.



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Cover Screws: **15-20 ft. lbs. (20-27 Nm)**

8. Proceed to "Gearcase Installation" before installing the coupler, lock washer and retaining nut. Doing so will allow you to properly torque the coupler retaining nut.

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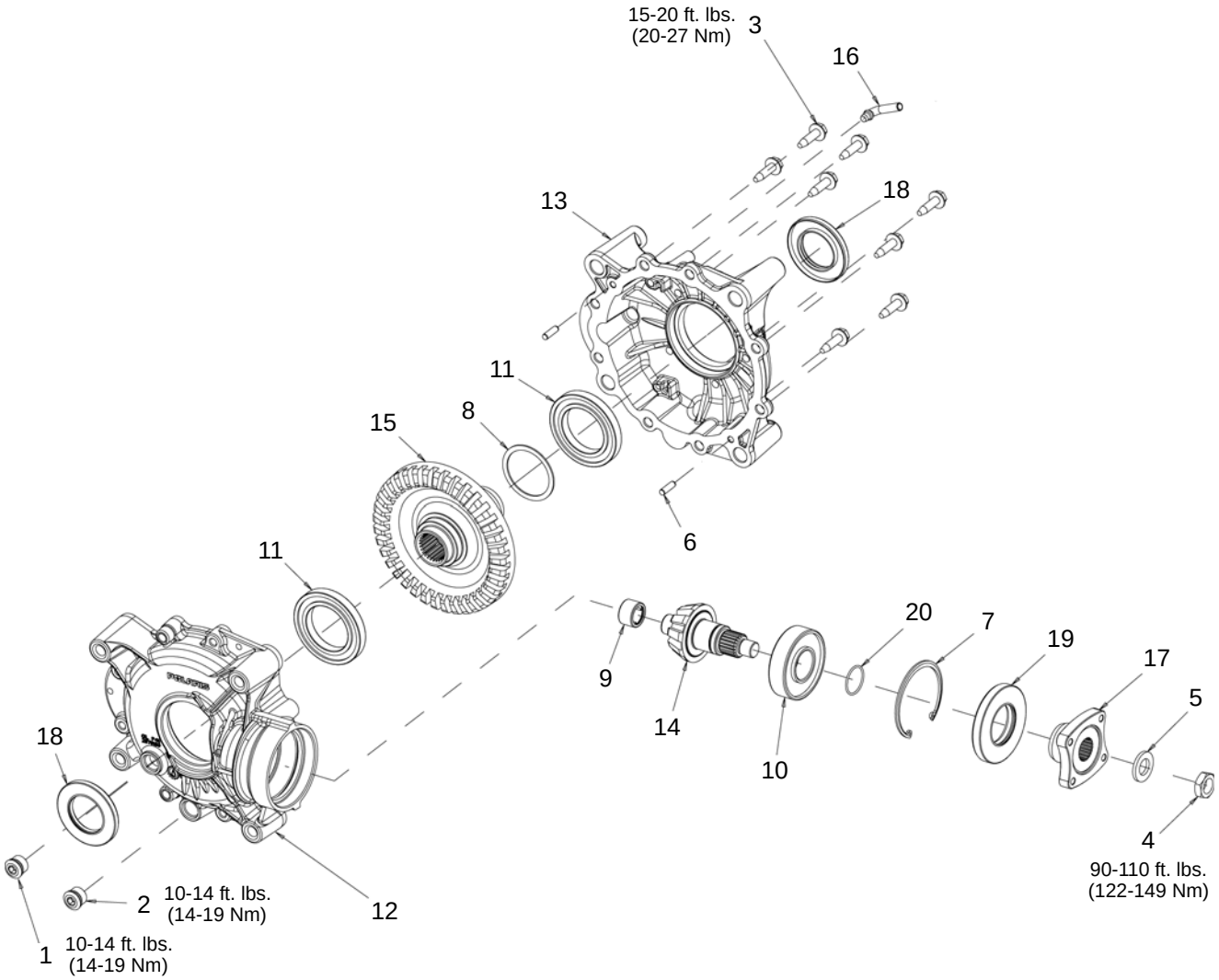
Gearcase Exploded View



REF#	DESCRIPTION	QTY	REF#	DESCRIPTION	QTY
1	Fill Plug with O-ring	1	11	Ball Bearing	2
2	Drain Plug with O-ring, Magnetic	1	12	Main Case, Machined	1
3	Screw	8	13	Cover, Machined	1
4	Nut	1	14	Pinion Shaft, 10T Straight Bevel	1
5	Lock Washer	1	15	Ring Gear, 37T Straight Bevel	1
6	Dowel Pin	2	16	Vent Tube	1
7	Retaining Ring	1	17	Coupler	1
8	Shim	1	18	Triple Lip Seal	2
9	Needle Bearing	1	19	Triple Lip Seal	1
10	Ball Bearing	1	20	O-Ring	1

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Gearcase Installation (XP Models)

1. Place the gearcase in the frame as shown by starting the lower portion first.

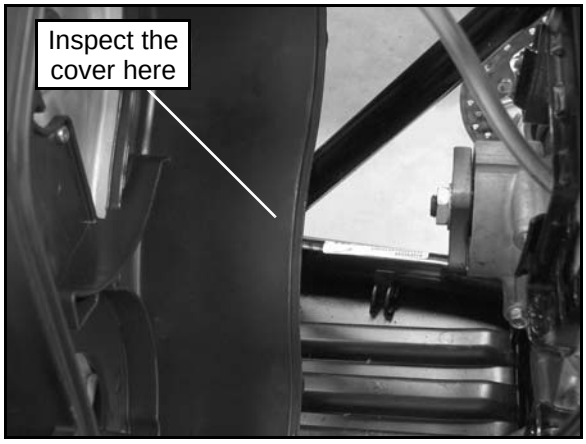
2. Using your hand, press down on the inner PVT cover and position the gearcase back into the frame while taking care not to damage the inner PVT cover.

IMPORTANT: Do not use a pry bar to flex the inner PVT cover as damage to the cover will occur.

3. Continue to position the gearcase back into the frame until the top portion clears the frame.

4. Position the gearcase in the frame and align the mounting holes of the gearcase to those in the frame.

5. Inspect the inner PVT cover for any signs of damage caused during removal or installation. If any burs are present, carefully clean them up with a flat hand file.



6. Continue the installation procedure by reversing the "Gearcase Removal" procedure at the beginning of this section. Refer to the following installation steps for torque specifications.

7. Install the gearcase through-bolt mounting fasteners and torque to specification.

NOTE: Use the longer bolts (150 mm) in the top and the shorter bolts (125 mm) in the bottom.

= T
Gearcase Mounting Fasteners: **40 ft. lbs. (54 Nm)**

8. Install the right rear drive shaft into the gearcase and the upper A-arm onto the bearing carrier. Torque the bearing carrier through-bolt fastener to specification.

= T
Rear Upper A-arm to Bearing Carrier: **40 ft. lbs. (54 Nm)**

9. Install the left rear drive shaft and suspension assembly. Torque the upper and lower A-arms to specification.

= T
Rear Upper & Lower A-arms to Frame: **45 ft. lbs. (61 Nm)**

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10. Install the rear upper shock through-bolts. Torque bolts to specification.

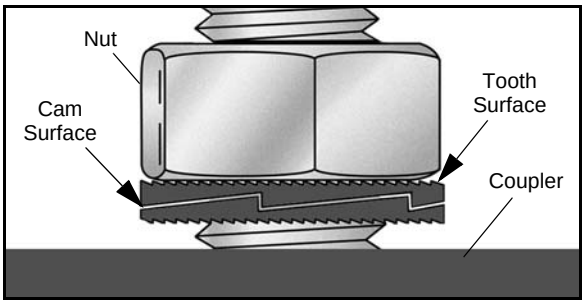
= T
Rear Upper Shock Bolts: **37 ft. lbs. (50 Nm)**

11. Install the rear stabilizer bar onto the linkage rods. Torque the linkage retaining nuts to specification.

= T
Stabilizer Bar Linkage Retaining Nuts: **17 ft. lbs. (23 Nm)**

12. Install the propshaft coupler onto the rear gearcase pinion shaft splines. Install the lock washer and retaining nut.

NOTE: Orientate the lock washer as shown with the tooth surfaces contacting the nut and coupler.



13. Lock the brake lever and torque the propshaft coupler retaining nut to specification.

= T
Coupler Retaining Nut: **90-110 ft. lbs. (122-149 Nm)**

14. Install the rear propshaft and torque bolts to specification.

= T
Rear Propshaft Bolts: **18 ft. lbs. (24 Nm)**

15. Install the drive clutch, driven clutch and drive belt. Refer to Chapter 7 “PVT SYSTEM SERVICE - PVT Assembly (XP Models)”.

16. Install the outer PVT cover, lower left-hand frame support and the left rear wheel. Refer to Chapter 7 “DRIVE BELT - Belt Installation (XP Models)”.

17. Install the rear wheels and torque wheel nuts to specification (see Page 8.2).

18. Add Polaris ATV Angle Drive Fluid to rear gearcase (see Chapter 2). Torque drain and fill plugs to specification.

=
Rear Gearcase Capacity: **7.1 fl. oz. (210 ml)** or to bottom of fill plug hole threads See Chapter 2 “Maintenance”

= T
Drain / Fill Plug: **10-14 ft. lbs. (14-19 Nm)**

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Gearcase Installation (TOURING Models)

1. Install the rear gearcase by reversing the "Gearcase Removal" procedure at the beginning of this section. Refer to the following installation steps for torque specifications.

2. Install the gearcase through-bolt mounting fasteners and torque to specification.

NOTE: Use the longer bolts (150 mm) in the top and the shorter bolts (125 mm) in the bottom.

= T
Gearcase Mounting Fasteners: **40 ft. lbs. (54 Nm)**

3. Install the right rear drive shaft into the gearcase and the upper A-arm onto the bearing carrier. Torque the bearing carrier through-bolt fastener to specification.

= T
Rear Upper A-arm to Bearing Carrier: **40 ft. lbs. (54 Nm)**

4. Install the left rear drive shaft and suspension assembly. Torque the upper and lower A-arms to specification.

= T
Rear Upper & Lower A-arms to Frame: **45 ft. lbs. (61 Nm)**

5. Install the rear upper shock through-bolts. Torque bolts to specification.

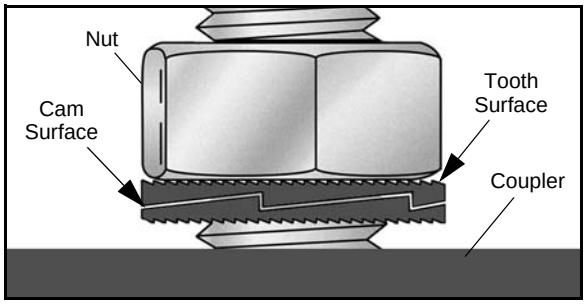
= T
Rear Upper Shock Bolts: **37 ft. lbs. (50 Nm)**

6. Install the rear stabilizer bar onto the linkage rods. Torque the linkage retaining nuts to specification.

= T
Stabilizer Bar Linkage Retaining Nuts: **17 ft. lbs. (23 Nm)**

7. Install the propshaft coupler onto the rear gearcase pinion shaft splines. Install the lock washer and retaining nut.

NOTE: Orientate the lock washer as shown with the tooth surfaces contacting the nut and coupler.



8. Lock the brake lever and torque the propshaft coupler retaining nut to specification.

= T
Coupler Retaining Nut: **90-110 ft. lbs. (122-149 Nm)**

9. Install the rear propshaft and torque bolts to specification.

= T
Rear Propshaft Bolts: **18 ft. lbs. (24 Nm)**

10. Install the rear wheels and torque wheel nuts to specification (see Page 8.2).

11. Add Polaris ATV Angle Drive Fluid to the rear gearcase (see Chapter 2). Torque drain and fill plugs to specification.

=
Rear Gearcase Capacity: **7.1 fl. oz. (210 ml)** or to bottom of fill plug hole threads See Chapter 2 "Maintenance"

= T
Drain / Fill Plug: **10-14 ft. lbs. (14-19 Nm)**

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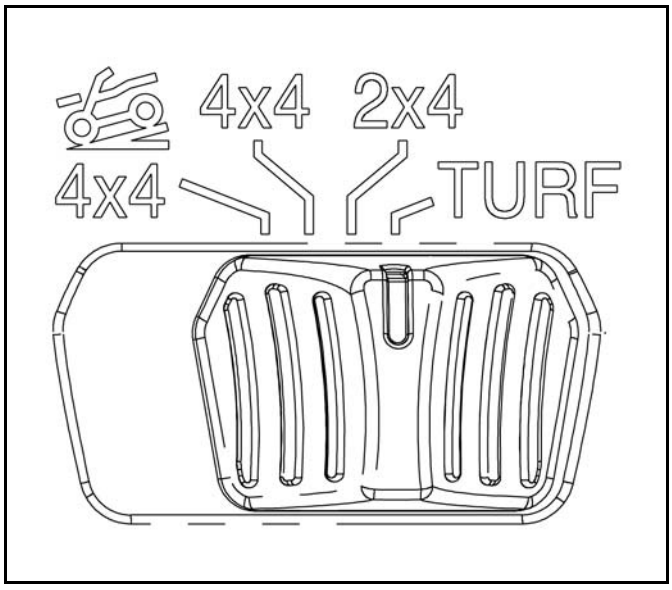
REAR DIFFERENTIAL GEARCASE (X2)

General Operation

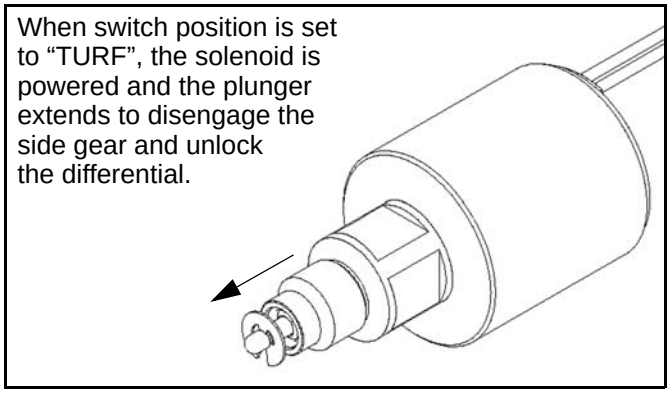
The Sportsman X2 rear differential has two traction operational modes:

- **Differential Lock: ADC 4x4 / AWD 4x4 / 2x4**
- **Differential Unlock: TURF**

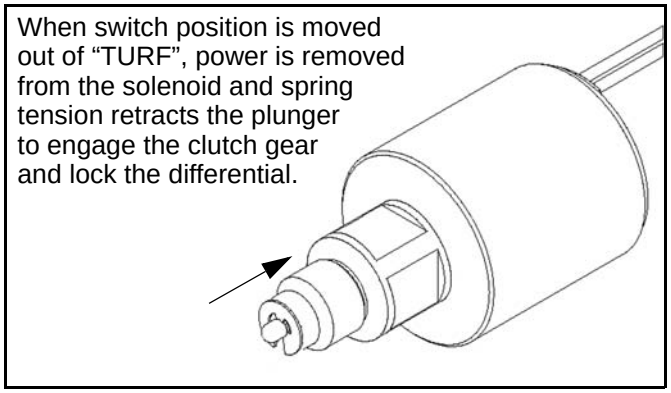
Locking the rear differential is beneficial in low traction and rough terrain conditions. Unlocking the rear differential makes maneuvering easier and minimizes damage to turf and other sensitive terrains.

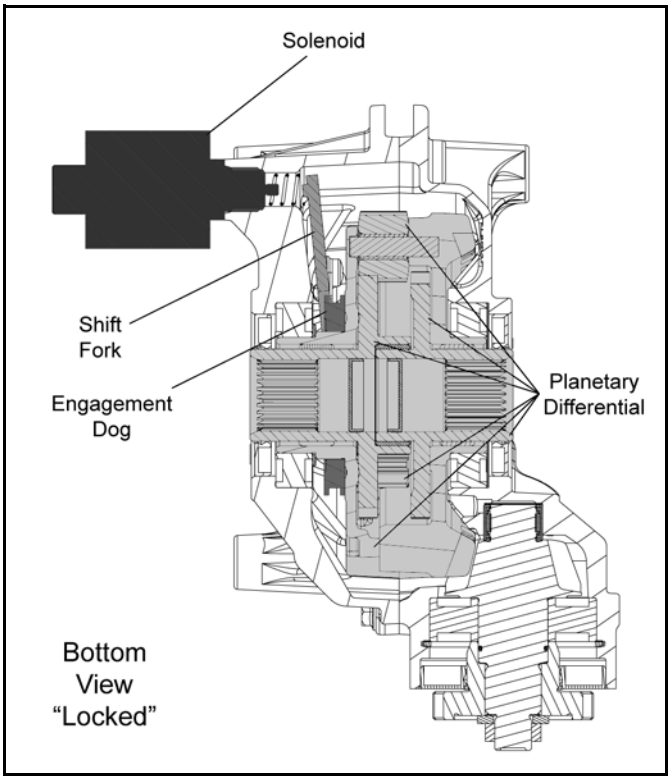


When "TURF" is selected on the switch, the rear differential becomes unlocked for tighter turns. An electrical solenoid mounted in the rear portion of the gearcase actuates the shift fork. The solenoid plunger extends out to move the shift fork and slides the engagement dog away from the side gear that is part of the planetary differential assembly. This unlocks the rear differential. The rear drive shafts are now dependent on the differential allowing for tighter turns.


When switch position is set to "TURF", the solenoid is powered and the plunger extends to disengage the side gear and unlock the differential.

When "ADC 4x4", "AWD 4x4" or "2x4" is selected on the switch, power is removed from the electrical solenoid allowing the solenoid plunger to retract. Spring tension moves the shift fork back into place and engages the engagement dog to the side gear that is part of the planetary differential assembly. This locks the rear differential as a solid rear axle, increasing traction.


When switch position is moved out of "TURF", power is removed from the solenoid and spring tension retracts the plunger to engage the clutch gear and lock the differential.



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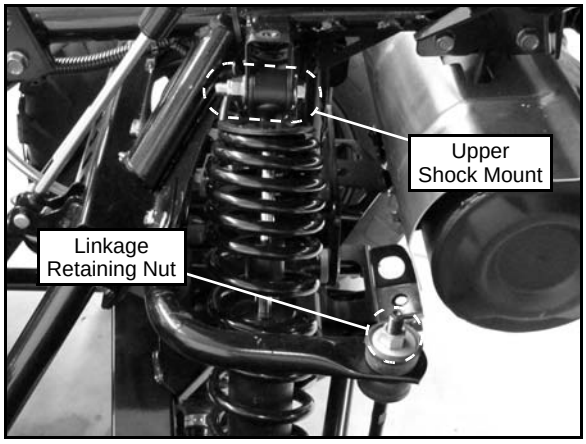
Gearcase Removal

1. Position the vehicle on a level surface, tilt the rear cargo box and remove driver's seat.
2. Remove the (6) T40 Torx-headed screws retaining the rear skid plate and remove the skid plate from the frame.
3. Drain the rear gearcase lubricant (see Chapter 2).
4. Elevate rear of vehicle and safely support machine under the frame area.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Always wear eye protection.

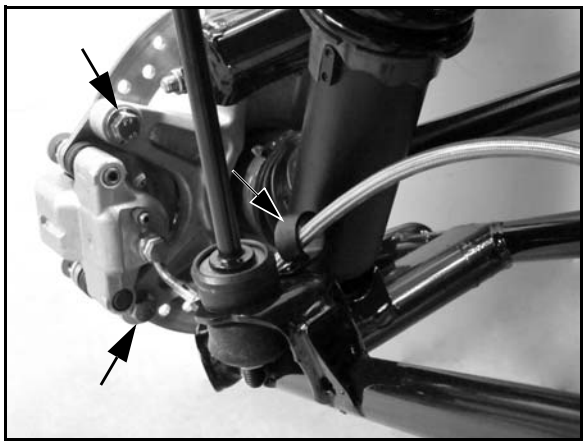
5. Remove the (4) wheel nuts retaining each wheel and remove both rear wheels.
6. Remove the (4) bolts retaining the rear propshaft.

7. Slide the shaft towards the transmission and pivot the propshaft down. Slide the propshaft off the transmission output shaft and out from the vehicle.
8. Remove the top retaining nut from each stabilizer bar linkage and rotate the stabilizer bar back out of the way.



NOTE: Hold the linkage rod with a 5/16" open-end wrench to prevent the rod from turning.

9. Remove the upper shock mounting bolts from each side.
10. Remove the brake line from the retainer and remove the left rear brake caliper.



> **CAUTION**
>
> Do not hang the brake caliper by the brake line. Use mechanics wire to hang the caliper to prevent from damaging the brake line.

11. Remove the (3) through-bolt fasteners retaining the left rear upper and lower A-arms to the frame.

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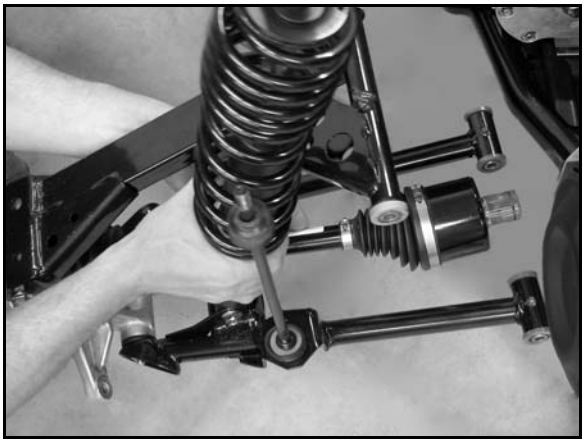
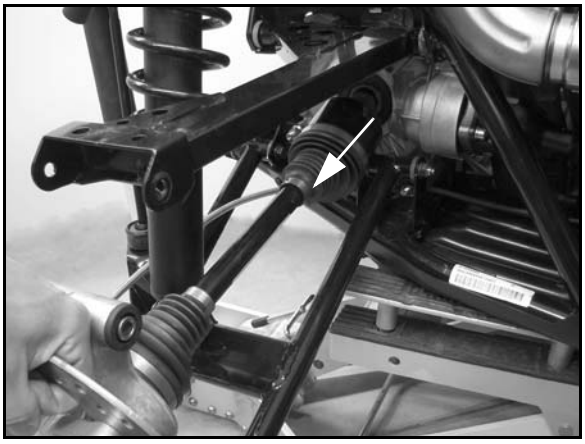
12. Remove the left rear suspension and drive shaft from the vehicle as an assembly.

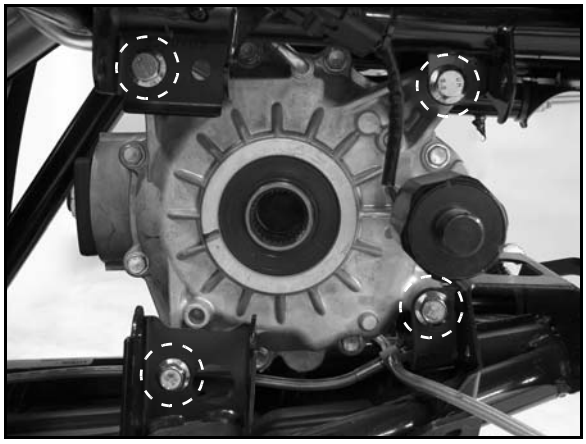


13. Remove the through-bolt fastener retaining the right rear upper A-arm to the bearing carrier. Pivot the wheel hub and bearing carrier down to remove the drive shaft from the gearcase.

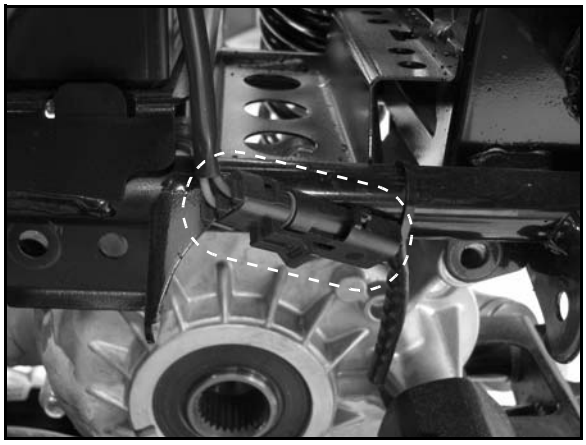


IMPORTANT: Take care not to stretch the brake line while removing the drive shaft.

14. Remove the (4) through-bolts retaining the rear gearcase to the frame.



15. Disconnect the rear differential solenoid harness and remove the plastic tie strap retaining the wires to the frame.



16. Move the gearcase forward in the frame and remove the vent line from the gearcase.

17. Using care, remove the rear gearcase through the bottom of the frame.

NOTE: Be sure to move the rear brake line out of the way upon removal to prevent from damaging it.

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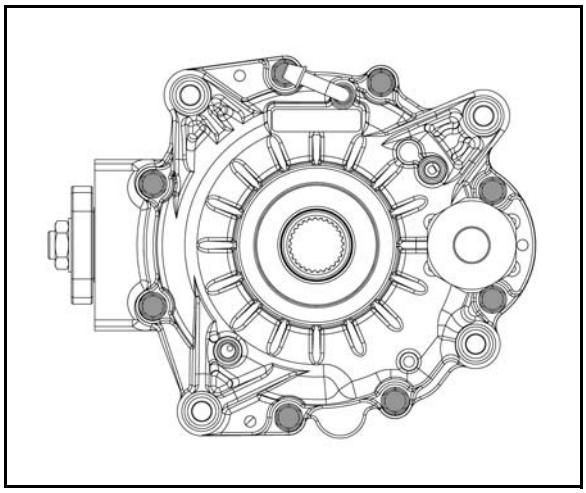
Gearcase Disassembly and Inspection

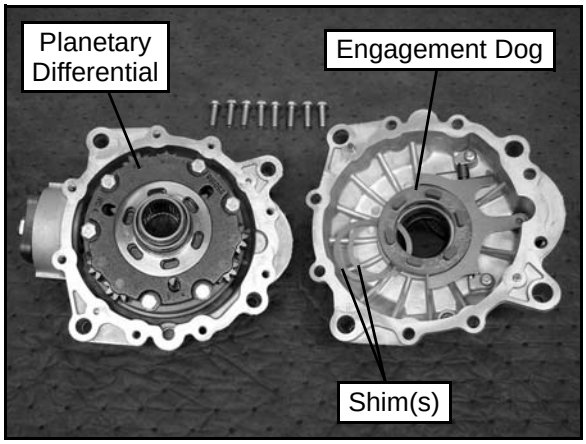
IMPORTANT: Pinion and ring gear shimming information is NOT provided. The components are matched at the factory which requires special OEM tooling in order to properly assemble and shim the gears.

In the event damage to the gears or housing requires replacement, the entire assembly must be replaced.

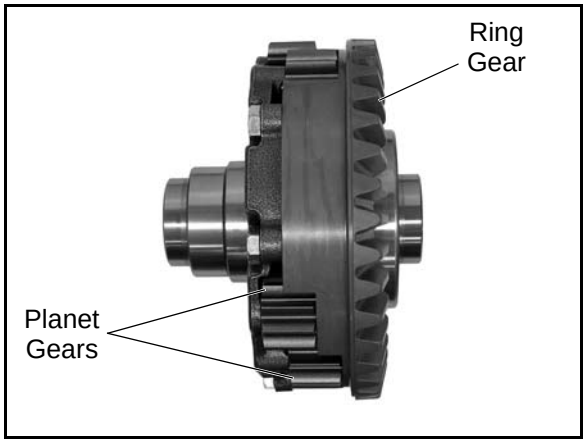
1. Drain and properly dispose of used gearcase lubricant.
2. Remove the (8) screws from the rear gearcase cover.



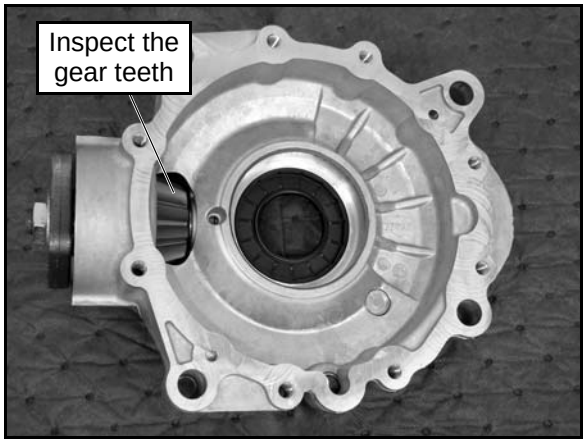
3. Lift the gearcase cover off the main gearcase half and note the shim(s) between the cover and the engagement dog.



4. Remove the planetary differential assembly from the main gearcase half.
5. Inspect the ring gear and planetary gears for chipped, worn, or broken teeth.

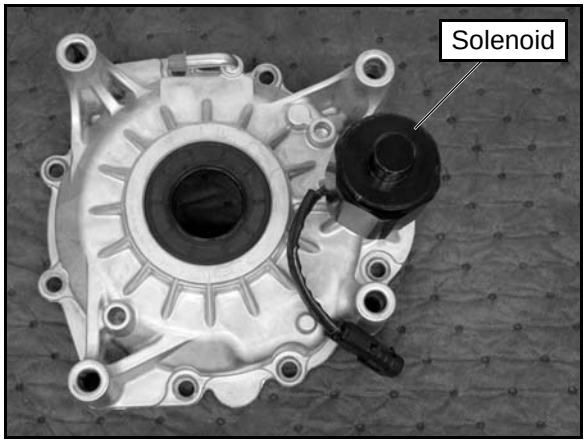


6. Inspect the pinion shaft by rotating the assembly in the gearcase housing while checking for any looseness or roughness. Inspect the pinion gear teeth for chipped, worn, or broken teeth.



NOTE: In the event damage to the gears or housing requires replacement, the entire assembly must be replaced.

7. Remove the differential solenoid from the gearcase cover **only** if servicing the solenoid.



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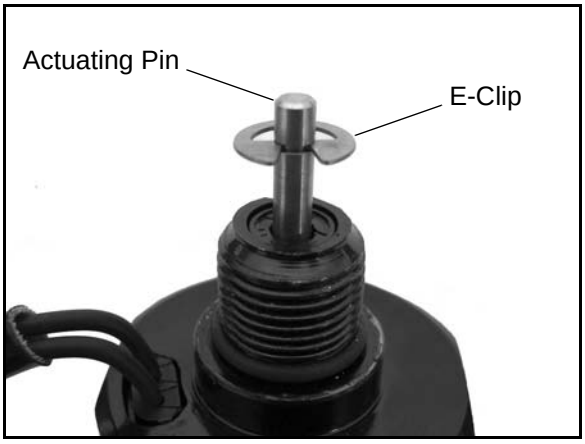
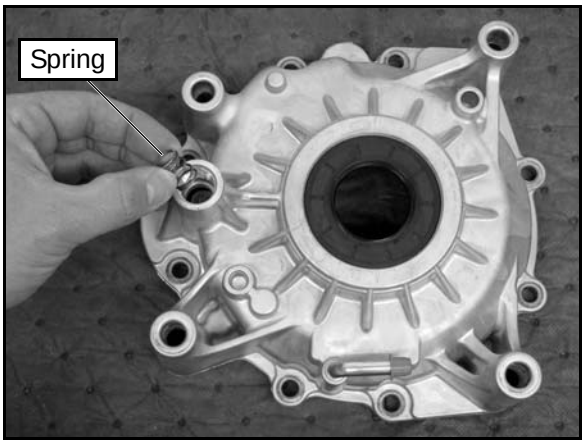
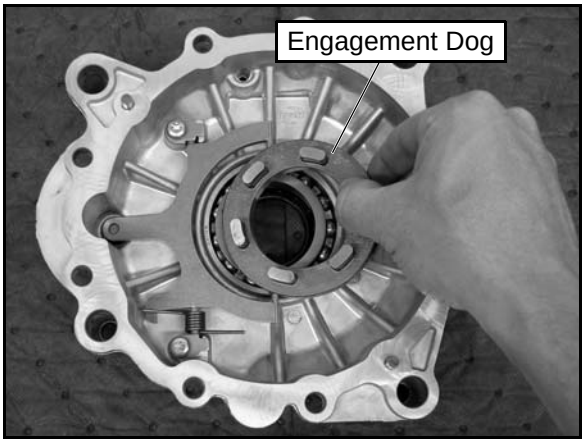
8. If the solenoid was removed for service, inspect the actuating pin and E-clip for wear.



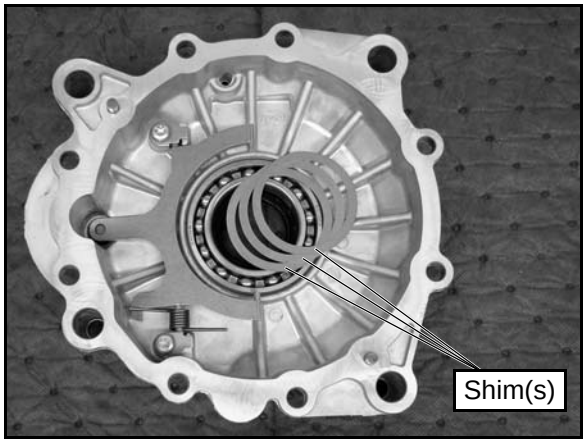
9. Remove the return spring from the gearcase cover and inspect the spring for signs of wear or fatigue.



10. Remove the engagement dog from the shift fork.

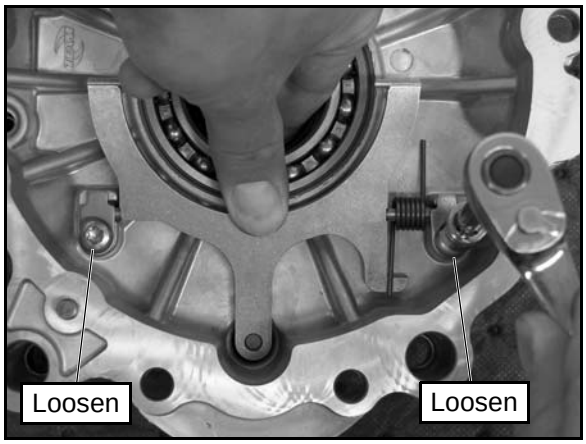


11. If not previously removed, record the number of shims (most will have only one) and remove from the cover.



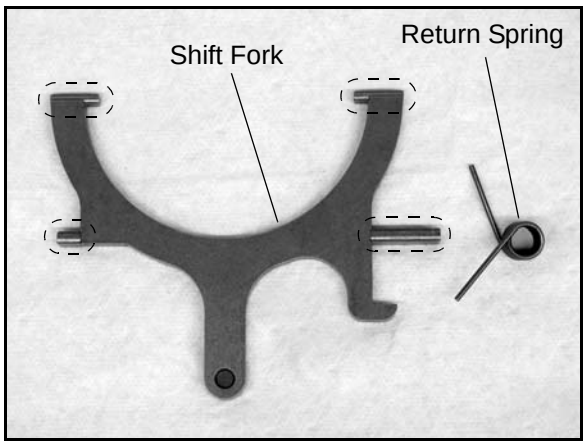
12. If the shift fork or torsion return spring require service, proceed to the next step, otherwise proceed to "Gearcase Bearing and Seal Replacement" or "Gearcase Assembly".

13. Hold down on the shift fork and loosen the retainer screws.



14. Rotate the shift fork retainer plates and carefully remove the shift fork.

15. Inspect the shift fork and torsion return spring for wear or damage and replace as needed.



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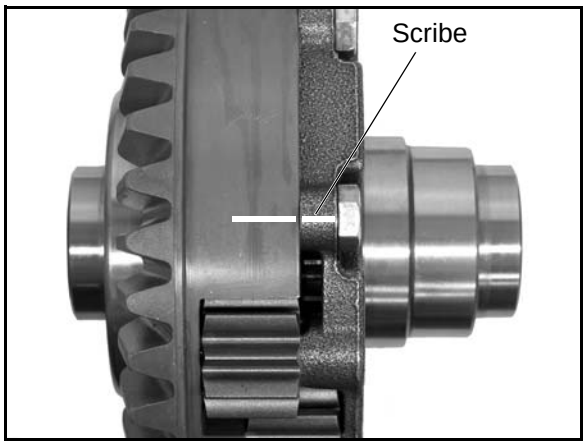
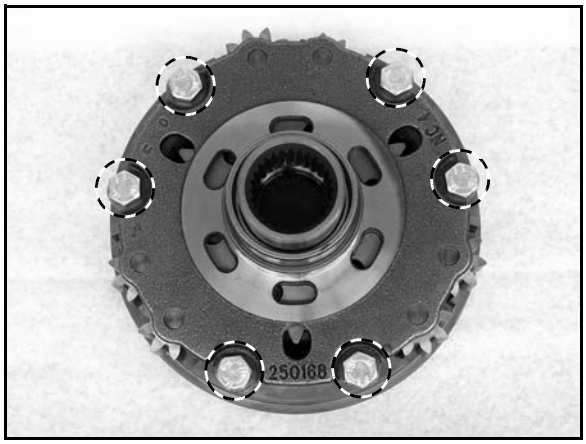
Planetary Differential Disassembly

NOTE: If the gearcase is completely assembled, perform the "Gearcase Disassembly and Inspection" procedure.

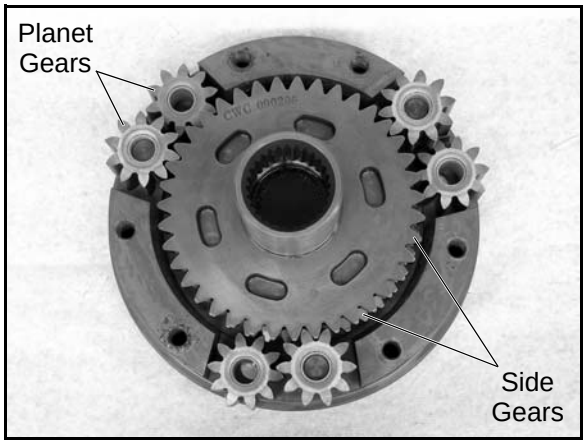
1. Use a scribe to mark the differential cover and ring gear prior to disassembly.



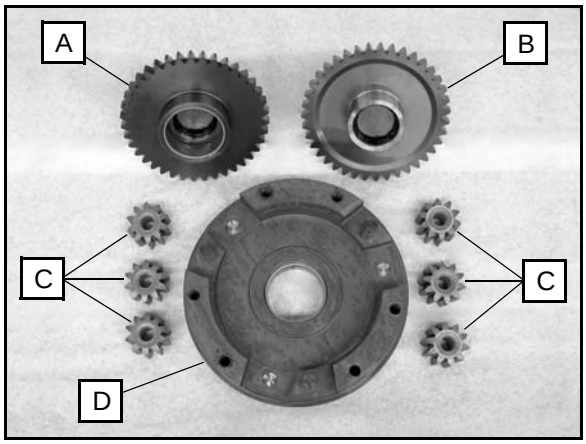
2. Remove the (6) screws retaining the differential cover and remove the cover.



3. Remove the (6) planet gears and each side gear assembly from the ring gear.



4. Inspect the female side gear (A), male side gear (B), planet gears (C) and ring gear (D). Replace components or bushings as needed. Bushing replacement can be performed on all necessary differential components. If bushing replacement is required, proceed to Planetary Differential Bushing Replacement".

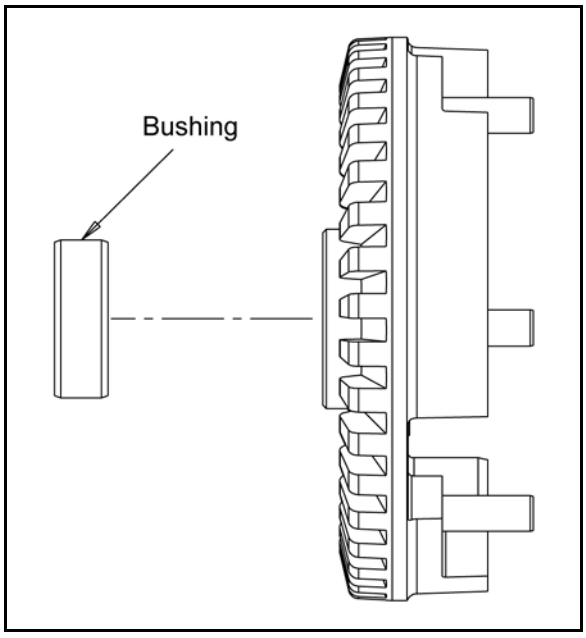


Planetary Differential Bushing Replacement

NOTE: If the differential is completely assembled, perform the "Planetary Differential Disassembly" procedure.

Ring Gear Bushing Replacement

1. Press the old bushing out of the ring gear.
2. Thoroughly clean the bore of the ring gear and check for any unwanted burs.
3. Press the new bushing into the ring gear housing.



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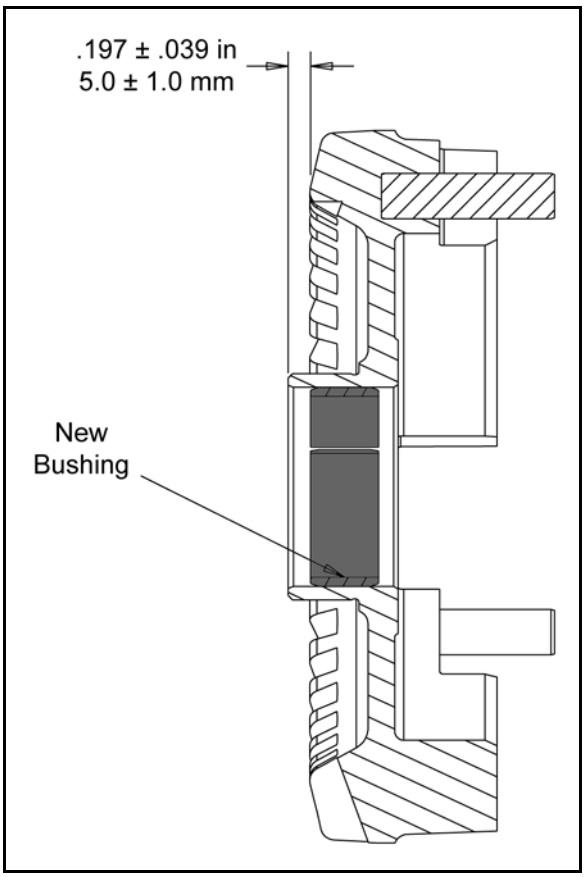
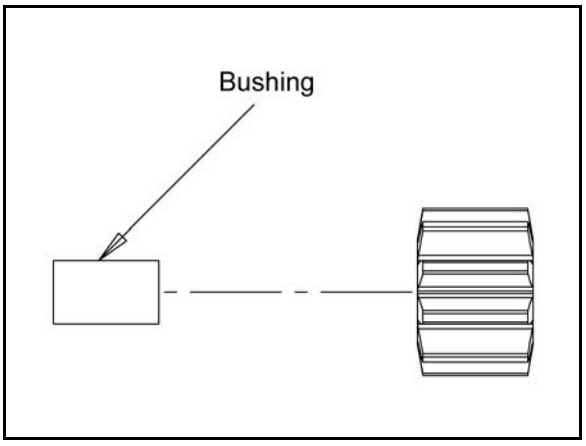
4. Install the bushing to the specified depth as shown.



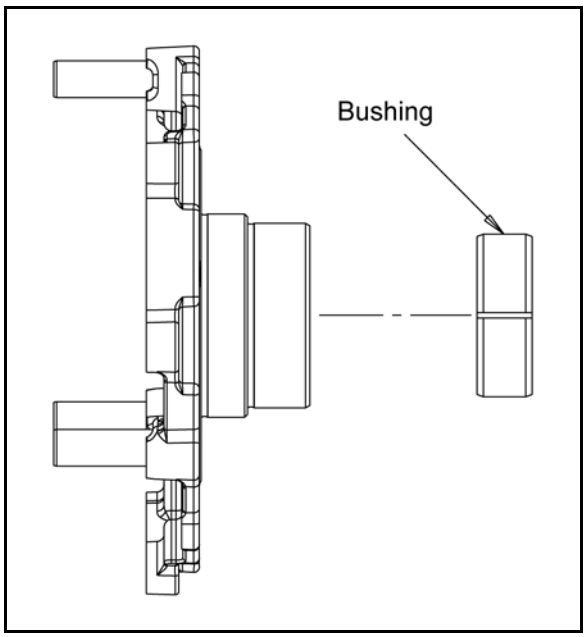
Planet Gear Bushing Replacement

1. Press the old bushing out of the planet gear.
2. Thoroughly clean the bore of the planet gear and check for any unwanted burs.
3. Press the new bushing into the planet gear until it is flush on each end. Repeat this procedure for the remaining planet gears.

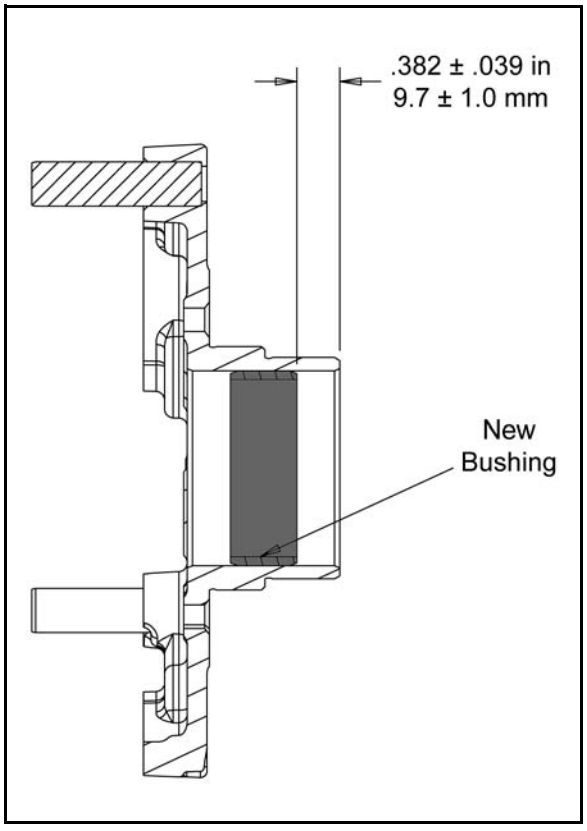


Differential Cover Bushing Replacement

1. Press the old bushing out of the differential cover.
2. Thoroughly clean the bore of the differential cover and check for any unwanted burs.
3. Press the new bushing into the differential cover.



4. Install the bushing to the specified depth as shown.



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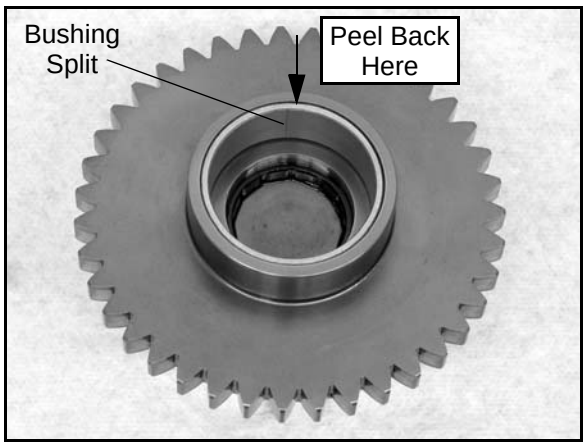
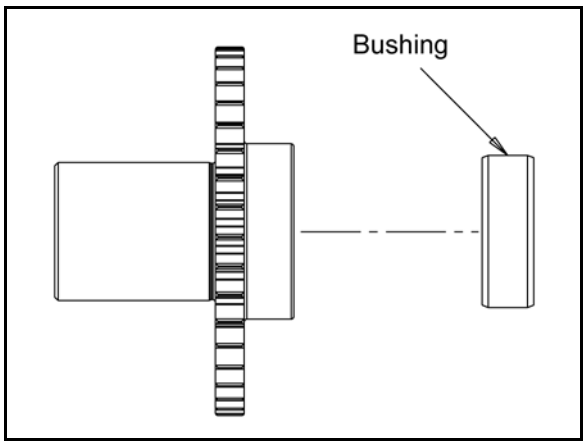
Female Side Gear Bushing Replacement

1. Locate the bushing split. Using a small chisel or flat blade screwdriver, peel back and remove the old bushing from the side gear, being careful not to damage the side gear.

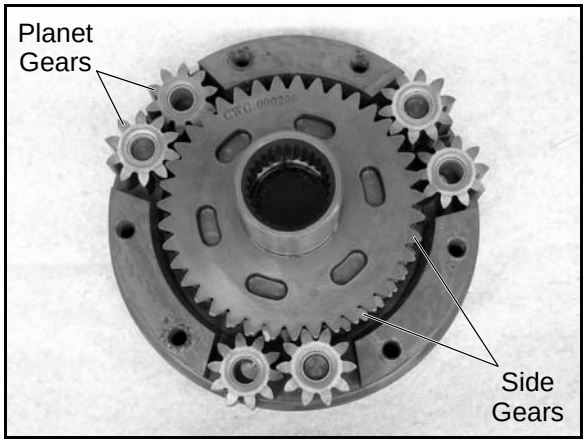


2. Thoroughly clean the bore of the side gear and check for any unwanted burs.
3. Press the new bushing into the side gear until it bottoms out.

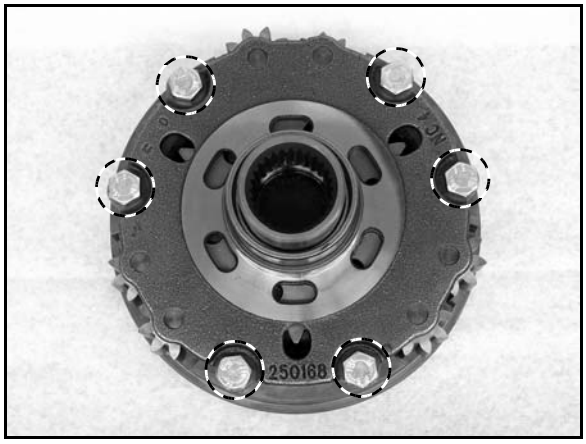


Planetary Differential Assembly

1. Thoroughly clean the differential components prior to reassembly.
2. Assemble the side gears and place them onto the ring gear along with the (6) planet gears.



3. Align and install the differential cover using the previously made scribe marks.
4. Apply Loctite® 2760 to the cover screws and torque the screws to specification.



= T
Differential Cover Screws: 18-22 ft. lbs. (24-30 Nm)

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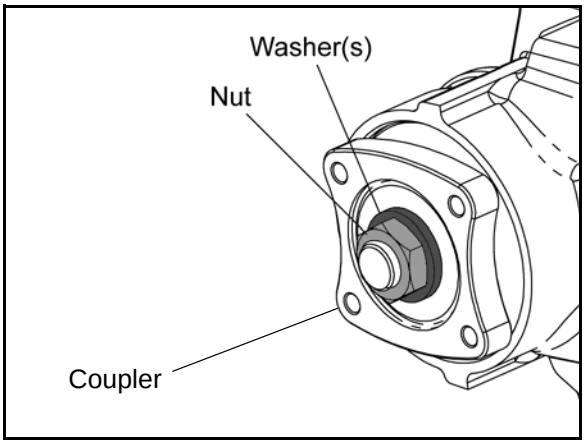
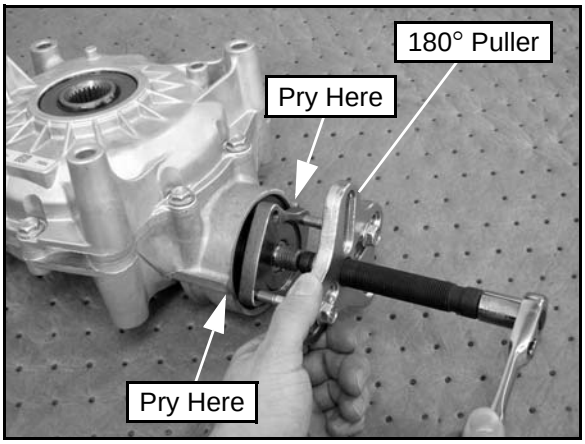
Gearcase Bearing and Seal Replacement

NOTE: If the gearcase is assembled, perform the "Gearcase Disassembly and Inspection" procedure.

1. Remove the nut and lock washer from the pinion shaft (if necessary, hold the coupler in a vise to remove the nut).



2. Remove the coupler from the pinion shaft by using two pry bars in the areas shown. If the coupler is difficult to remove, use a universal bolt-grip puller to prevent any damage.



3. Remove the seal above the pinion shaft using a seal puller or other suitable method (see Figure 8-27).

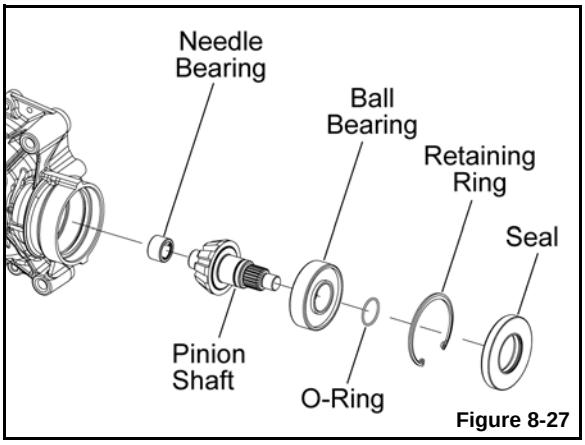


Figure 8-27

4. Remove the retaining ring and lift the pinion shaft and bearing from the main gearcase (see Figure 8-27).

NOTE: If the pinion shaft will not lift out of the gearcase, reinstall the coupler and finger tighten the retaining nut. Use two pry bars to lift the pinion shaft assembly out.

5. Support the pinion shaft and press the bearing off the shaft (see Figure 8-27).
6. Thoroughly clean the pinion shaft.

> **⚠ WARNING**
>
> Wear appropriate safety equipment while installing bearings to reduce the risk of injury.

7. Support the pinion shaft and carefully press the new bearing on the shaft and install a new O-ring (see Figure 8-27).

IMPORTANT: Carefully inspect the pinion shaft gear before replacing the bearing. If the gear teeth are damaged, the shaft must be replaced as an assembly.

8. Remove the seals from each case half using a seal puller or other suitable method (see Figure 8-28).

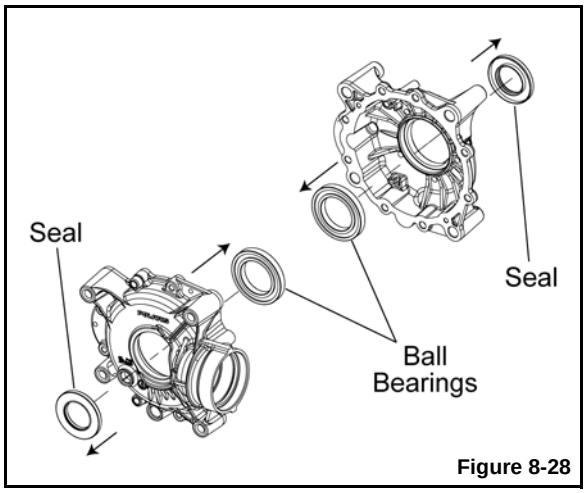


Figure 8-28

9. Support the gearcase cover and press the bearing out. Repeat this procedure on the main gearcase half, unless the bearing came out with the ring gear (see Figure 8-28).

NOTE: If the main gearcase bearing is installed on the ring gear, heat the bearing to remove it.

10. Thoroughly clean the gearcase halves.

> **⚠ WARNING**
>
> Wear appropriate safety equipment while installing bearings to reduce the risk of injury.

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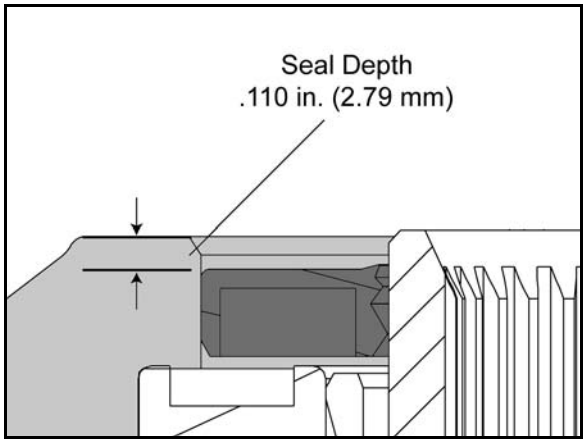
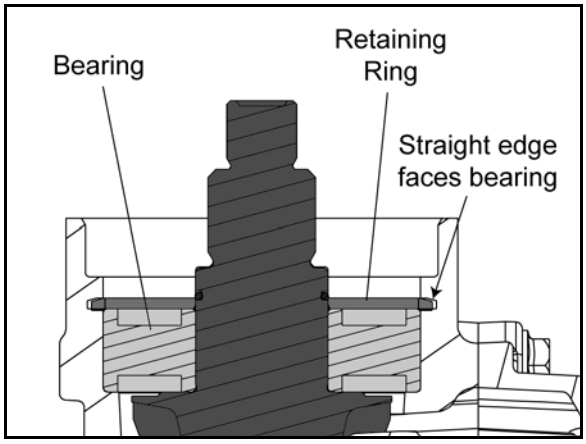
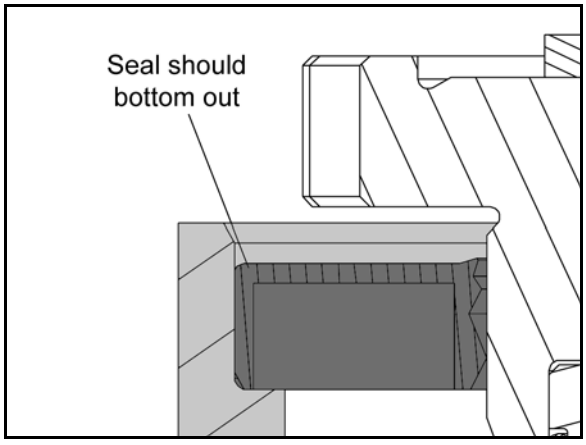
11. Support the gearcase cover and carefully press in the new cover bearing (see Figure 8-28). Support the ring gear and carefully press on the new main gearcase bearing.
12. Install the seals into the case halves using a standard seal installer or other suitable method. Seal depth should be approximately .110 in. (2.79 mm) from the main surface.



13. Install the pinion shaft and a new retaining ring. Install the retaining ring with the straight edge facing the bearing.

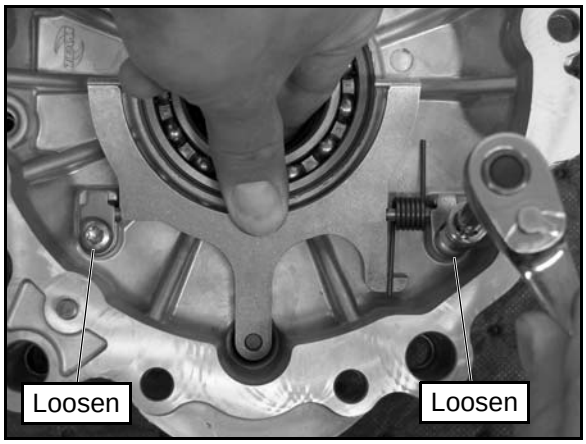


14. Install the seal into the main gearcase half using a standard seal installer or other suitable method. Press seal into the gearcase until it bottoms out in the housing.



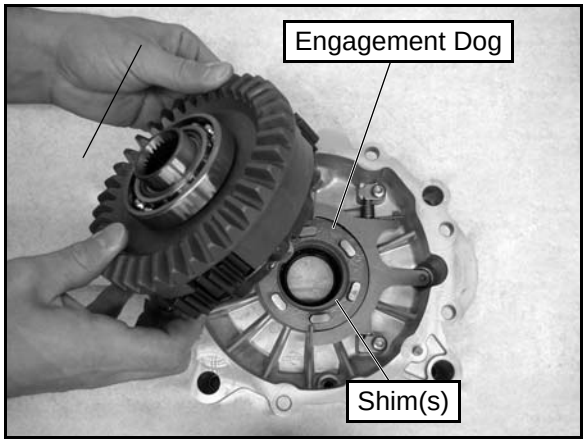
Gearcase Assembly

1. Grease all seals with Polaris All Season Grease (PN 2871322) upon assembly to prevent from damaging seals.
2. If previously removed, reinstall the shift fork and torsion return spring. Torque the retainer screws to specification.



= T
Shift Fork Retainer Screws: 7-10 ft. lbs. (10-14 Nm)

3. Install the engagement dog onto the shift fork and install the shim(s) between the engagement dog and gearcase cover.
4. Carefully set the differential assembly into the gearcase cover. Rotate the differential assembly until it properly seats in the cover.



NOTE: Do not strike the differential assembly to seat it in the cover.

5. Thoroughly clean the gearcase mating surfaces and be sure the alignment pins are in place.
6. Apply Crankcase Sealant (PN 2871557) to mating surfaces.

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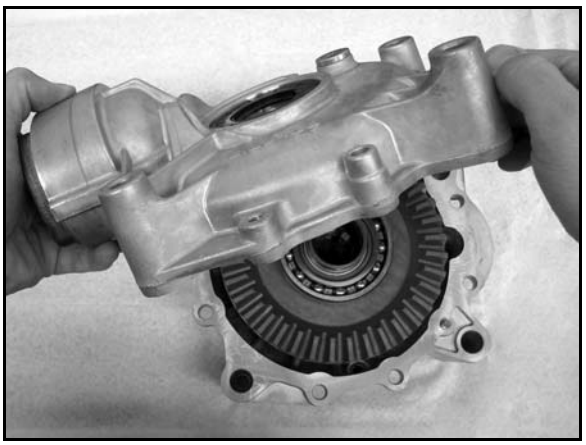
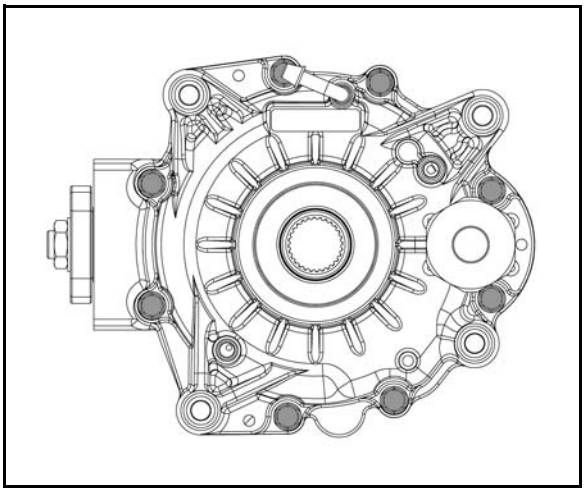
7. Install the main gearcase half onto the gearcase cover.

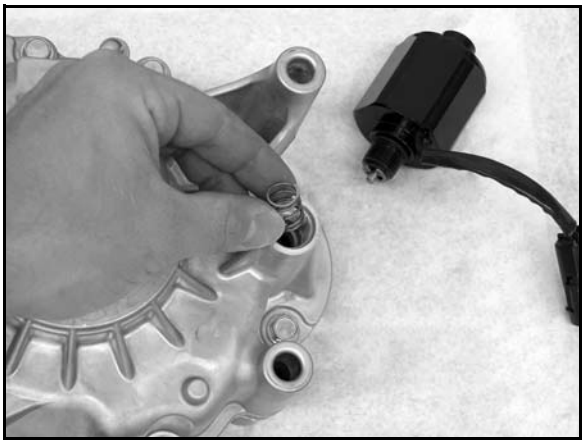


8. Install the cover screws and torque to specification.

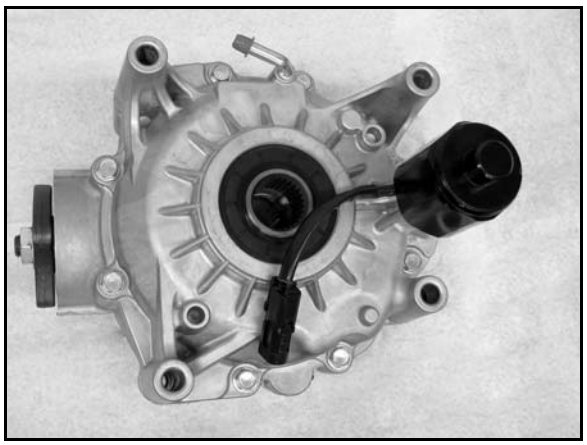


= T
Cover Screws: **15-20 ft. lbs. (20-27 Nm)**

9. If previously removed, install the solenoid return.



10. If previously removed, install the differential solenoid.



11. Proceed to “Gearcase Installation” before installing the coupler, lock washer and retaining nut. Doing so will allow you to properly torque the coupler retaining nut.

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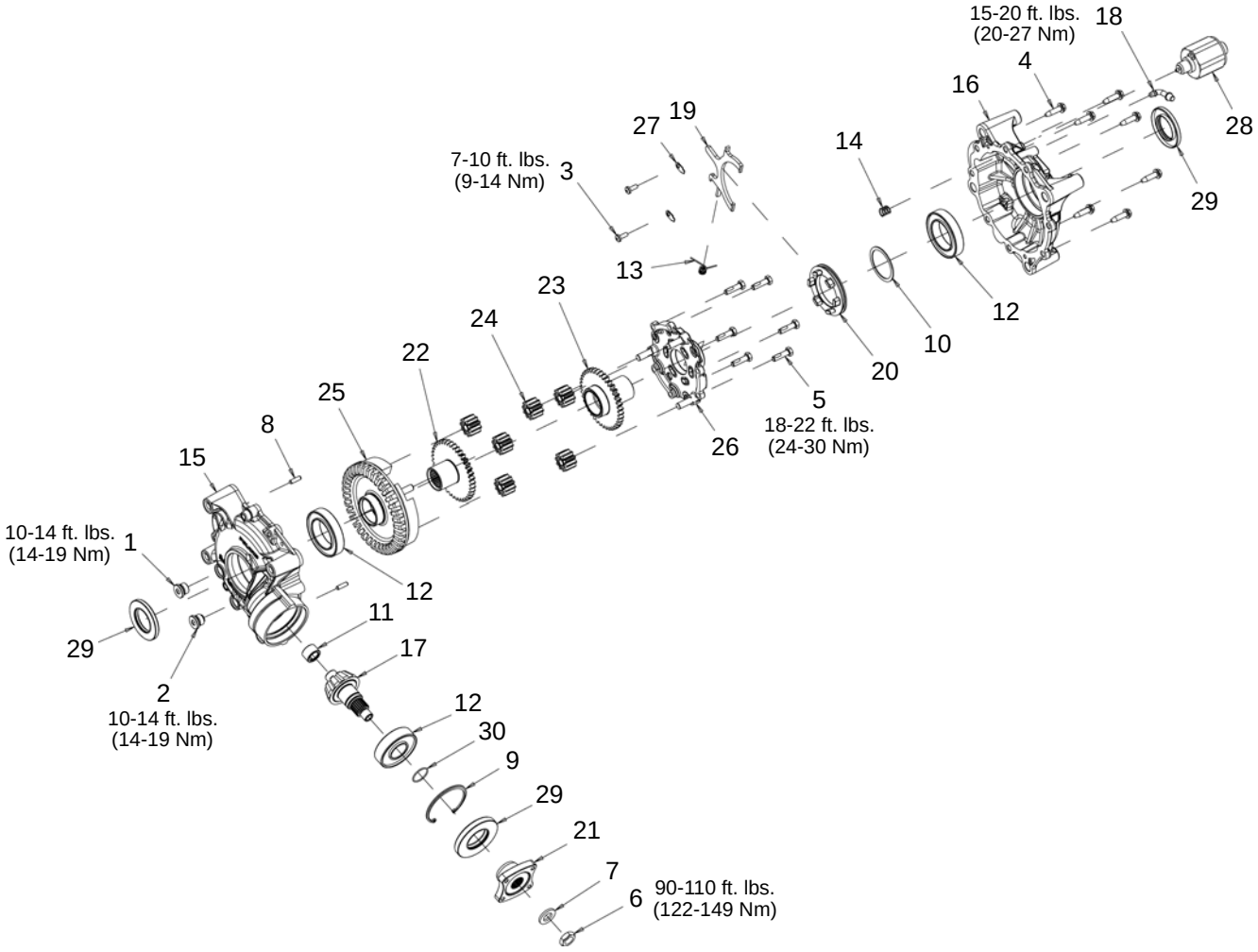
Gearcase Exploded View



REF#	DESCRIPTION	QTY	REF#	DESCRIPTION	QTY
1	Fill Plug with O-ring	1	16	Cover, Machined	1
2	Drain Plug with O-ring, Magnetic	1	17	Pinion Shaft, 10T Straight Bevel	1
3	Screw, M6	2	18	Vent Tube	1
4	Screw, M8	8	19	Pivot Shift Fork	1
5	Screw, M8	6	20	Engagement Dog	1
6	Nut, M16	1	21	Coupler	1
7	Lock Washer	1	22	Subassembly, 39T Side Gear	1
8	Dowel Pin	2	23	Subassembly, 39T Side Gear Disconnect	1
9	Retaining Ring	1	24	Gear, Planet Subassembly	6
10	Shim	1	25	Gear, 37T Straight Bevel	1
11	Needle Bearing	1	26	Carrier Cover Subassembly	1
12	Ball Bearing	3	27	Fork Retainer	2
13	Torsion Return Spring	1	28	Solenoid	1
14	Compression Spring	1	29	Triple Lip Seal	3
15	Main Case, Machined	1	30	O-Ring	1

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Gearcase Installation

1. Install the rear gearcase by reversing the "Gearcase Removal" procedure at the beginning of this section. Refer to the following installation steps for torque specifications.
2. Install the gearcase through-bolt mounting fasteners and torque to specification.

NOTE: Use the longer bolts (150 mm) in the top and the shorter bolts (125 mm) in the bottom.

= T
Gearcase Mounting Fasteners: **40 ft. lbs. (54 Nm)**

3. Install the right rear drive shaft into the gearcase and the upper A-arm onto the bearing carrier. Torque the bearing carrier through-bolt fastener to specification.

= T
Rear Upper A-arm to Bearing Carrier: **40 ft. lbs. (54 Nm)**

4. Install the left rear drive shaft and suspension assembly. Torque the upper and lower A-arms to specification.

= T
Rear Upper & Lower A-arms to Frame: **45 ft. lbs. (61 Nm)**

5. Install the left rear brake caliper and brake line retainer. Torque brake caliper mounting bolts to specification.

= T
Brake Caliper Mounting Bolts: **37 ft. lbs. (50 Nm)**

6. Install the rear upper shock through-bolts. Torque bolts to specification.

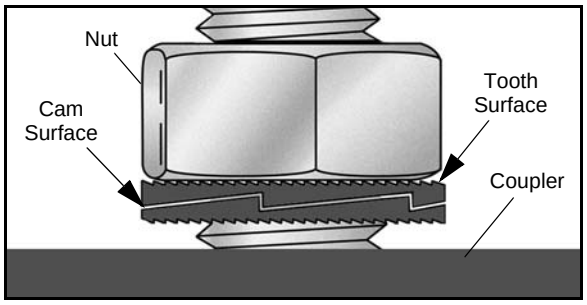
= T
Rear Upper Shock Bolts: **37 ft. lbs. (50 Nm)**

7. Install the rear stabilizer bar onto the linkage rods. Torque the linkage retaining nuts to specification.

= T
Stabilizer Bar Linkage Retaining Nuts: **17 ft. lbs. (23 Nm)**

8. Install the propshaft coupler onto the rear gearcase pinion shaft splines. Install the lock washer and retaining nut.

NOTE: Orientate the lock washer as shown with the tooth surfaces contacting the nut and coupler.



9. Lock the brake lever and torque the propshaft coupler retaining nut to specification.

= T
Coupler Retaining Nut: **90-110 ft. lbs. (122-149 Nm)**

10. Install the rear propshaft and torque bolts to specification.

= T
Rear Propshaft Bolts: **18 ft. lbs. (24 Nm)**

11. Install the rear wheels and torque wheel nuts to specification (see Page 8.2).
12. Add Polaris ATV Angle Drive Fluid to the rear gearcase (see Chapter 2). Torque drain and fill plugs to specification.

=
Rear Gearcase Capacity: **6.1 fl. oz. (180 ml)** or to bottom of fill plug hole threads See Chapter 2 "Maintenance"

= T
Drain / Fill Plug: **10-14 ft. lbs. (14-19 Nm)**

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